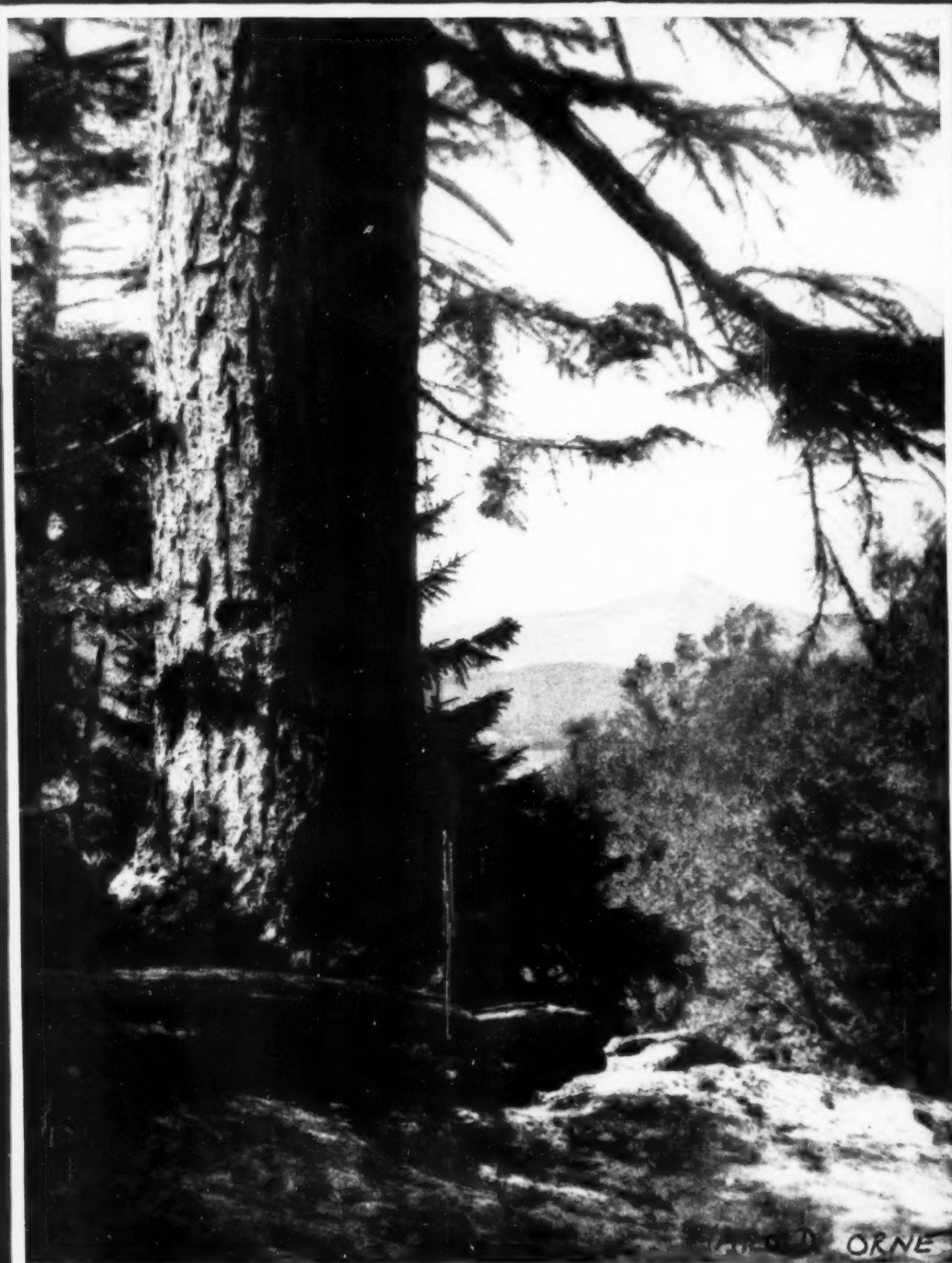


AMERICAN FORESTS



WILLIAM D. ORNE

MARCH 1943

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AMERICAN FORESTS

VOLUME 49

MARCH, 1943

NUMBER 3

Editor
OVID BUTLER

Associate Editors
LILIAN CROMELIN ERLE KAUFFMAN

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American Forests

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THE
AMERICAN FORESTRY
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The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

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The Forest Exchange

Wood Gas

SIR: In the news item about the gasogene in your December issue the statement is made that the Forest Product Laboratory test is thought to be the first instance in which wood-gas has been adapted to an American automobile. This is not the case.

I haven't too definite information as to what other gasogines in this country preceded the Laboratory's tests, but I know of a test made in California by the Pickering Lumber Company about twenty years ago. Agencies in Canada also made tests prior to the Laboratory, and the Connecticut Forest and Park Association and the Champion Fiber Company also equipped trucks prior to the Laboratory's test car.—*C. V. Sweet*, Chief, Division of Industrial Investigations, Forest Products Laboratory, Madison, Wisconsin.

Worth Fighting For

SIR: For years many of my friends in Illinois have by-passed Wisconsin for the wilds of Canada because they found resorts on every Wisconsin lake and river called wild. When they hear of Also Leopold's stirring appeal in *AMERICAN FORESTS* (January issue), to save a part of the Flambeau River in a semi-wild condition, they will cheer. I am writing to several of my canoe companions, now fighting for democracy in Africa. We plan to take a canoe trip down the Flambeau after victory, and when they return. It will be even more cheering to write to them and tell them that Wisconsin has completed its consolidations in the Flambeau State Forest, has permanently dedicated the Flambeau's river banks to canoe trip recreation, and saved the mast martens and wolves in Wisconsin. These are a few of the many things they are fighting for. Please follow up this article and let us know what happens. We would like to hear about other Wisconsin conservation issues.—*W. Schwass*, Chicago, Illinois.

The January Number

SIR: May I express my appreciation of the value of *AMERICAN FORESTS* and of the rich returns that have come to me from my membership for many years. The articles (January issue) of the forests of England (Britain's Ancient Forests) and tree selections (Shade Tree feature) with its questionnaire, and on Mr. Rutledge's splendid effort

(Plantation—Modern Style) are very inspiring. Mr. Rutledge's book, published sometime ago, was a delightful contribution and what he is doing will, I hope, inspire many to follow in his steps.—*Mrs. Charles Biddle*, Andalusia, Pennsylvania.

Ginkgo at South Pole

SIR: The article by L. E. Manning in the February issue (Shade Tree feature) about the ginkgo is very interesting. Is this of any interest to you or to him?

In 1933 my son went on the second Byrd Expedition. He and two other youngsters left little America and with two dog teams in three months went some 1,500 miles up the Thorne Glacier. About 180 miles from the South Pole, at an elevation of about 9,000 feet, among mountains never before seen by man, they found coal and fossils.

I showed these fossils to the Bartlett tree people and they at once identified them as leaves of the ginkgo tree. Obviously, the presence of coal means that once the South Pole was tropical—at a time, I suppose, when New England was covered with a mile of ice.—*Richard S. Russell*, Boston, Massachusetts.

When a Fox Barks

SIR: It occurs to me that foresters have some rare experiences or observations, such as hearing the cry of the puma, which I have heard twice. I recall one observation on animal life that appears very unusual. At least, I have no recollection of ever having heard or read of such an account.

It happened back in 1907 when I was a night guard on a logging operation out in California. Frequently, as soon as it became dark, a fox emerged from a den, yipped a little, and circled out around me, so close I could hear him trotting. One night he proceeded as usual, but before he was out of my hearing he began circling, clockwise, the outer branches of a fir tree, whining continuously. After some minutes of this, an owl flew out of the tree, and the fox dashed after it in hot pursuit. In a moment both had disappeared. Then, from a canyon some distance below, came a few sharp barks from the fox.

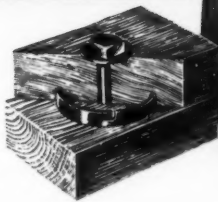
I have wondered if foxes are often successful in acquiring game in this manner? Did the sharp barks indicate that he had lost his quarry?—*C. A. Miner*, Athens, Ohio.

BIG HAUL

FOR UNCLE SAM

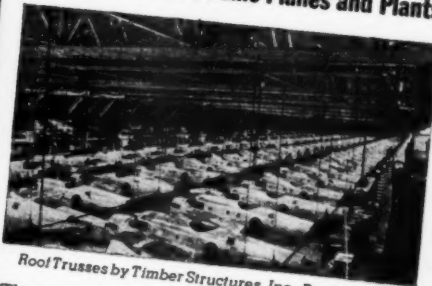
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THE EDITOR'S LOG

Special Issue

Colonel Russell P. Reeder, an infantry officer recently returned from the Southwest Pacific, discloses the interesting fact that the Japs on Guadalcanal have been using wooden bullets. They will kill only at fifteen or twenty yards, he states, and are used against our men from the rear, usually after forward patrols have passed concealed enemy riflemen.

Americans are using wooden ammunition, too, but it is not shot out of rifles at fifteen yards. It is fired at the enemy in the form of ships, planes, bombs and food. Its deadly range is from Washington to Tokyo, from Washington to Berlin.

A good share of the wood for this ammunition is supplied by the forests of eastern Oregon and Washington, the great Douglas fir region of the Pacific Northwest. That readers may be better informed on what is taking place in this highly important timber area, both as to wartime production and peacetime resource outlooks, the May issue of *AMERICAN FORESTS* will be dedicated to the region—a special Pacific Northwest Number.

Here is a brief glimpse into its contents: E. H. MacDaniels, veteran forester, now engaged in a comprehensive appraisal of the forest situation in the Douglas fir area, will analyze these resources and their place in the land economy of the Pacific Northwest; William B. Greeley, secretary-manager of the West Coast Lumbermen's Association, and former chief forester of the United States, will describe the impacts of war upon these forests, and probable post-war conditions; James Stevens, well known author, will report on the war services of Pacific Northwest forests in the building of ships, airplanes, and other needed weapons; the forest fire situation will be dealt with by John B. Woods, forester for the Oregon Forest Fire Association.

Stephen N. Wyckoff, director of the Pacific Northwest Forest and Range Experiment Station, will write of the place of western Oregon and Washington forests in a national forest policy. Industrial forestry in the region will be spotlighted by four outstanding lumbermen—Corydon Wagner, J. P. Weyerhaeuser, Jr., Donald Denman, and C. H. Kreienbaum.

The importance of the forest resource and its management from the standpoint of state interests and welfare, will be pictured by Governor Earl Snell of Oregon, and Governor Arthur B. Langlie of Washington. State foresters will outline their programs. Roderic Olzendam will write of the part forests and forest industries have played in developing the social and economic life of the region. Labor's viewpoint and interest in the forest resource and in maintaining permanent forest industries will be presented by Peter Terzick, editor of the *Union Leader*.

These are highlights of an issue you cannot afford to miss.

In England

Reports from England indicate that the highways and byways of that little Island are being combed with ax and saw for trees—any tree that in any way will help win the war. If an American could tour England now he would probably bless thrice over the heritage which is the United States' in the nature of trees and forests. There is another integral part of that heritage which needs mentioning because too few people in this country give it either thought or appreciation. Foresters call it "forest-growing soil." Ages of creation may build up forests of one sort or another even on the poorest soil, but when these forests are clean cut by man, the forester's best friend in rebuilding a wood supply is good forest-growing soil.

This is graphically brought home by a letter recently received from England by the editor. "You must remember," the writer said, "that in most parts of the United States even the most appalling devastation is followed by some sort of tree growth unless prevented by repeated fire, while in most parts of Great Britain natural reproduction is scarce or unknown. So it is a question of expensive planting or waste land, mostly the latter with the present lack of money and labor."

When the war is over, England will probably be an outstanding example of war's effect on the forest resources of nations across the Atlantic. Most of these countries even in peacetime have to import lumber from the few nations with forest surpluses. As in

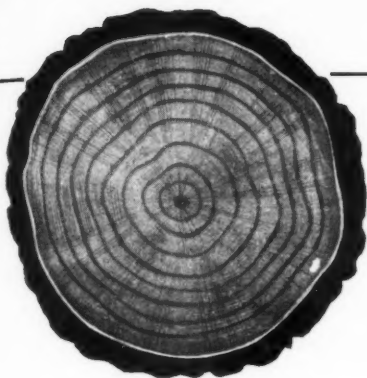
England the war now is draining off forest growth over a wide expanse of the civilized world. Over-cutting and destruction is reported everywhere in the warring and occupied countries. Every thinking forester knows that the forest depletion that is going on in England and European countries will have repercussions in America.

Lack of wood and the tremendous demand that is building up for it when reconstruction of these countries is at hand means pressure on our own forests. It is a fair prediction that this pressure, involved as it will be in international relations, may be so great as to complicate seriously and intensify our own forest problems when the war is over. Skilful diplomacy will be called for in dealing with it and that in turn will call for more exact information than we now have of our own forest situation and our post-war needs. The one comforting fact is that we have the forest growing soils in abundance.

A Rubber Bear

Figuratively speaking, the U. S. Forest Service is in a fair way to have a rubber bear by the tail. The bear is the war task of growing the rubber-bearing shrub guayule. As previously reported in *AMERICAN FORESTS*, the guayule undertaking was assigned the Forest Service a year ago with \$31,000,000 from the President's war funds to start the work. To the project the Service assigned one of its Regional Foresters—Evan W. Kelley of Montana. Kelley knew his tall growing pines and firs but if he knew guayule at all it was just worthless southwestern brush to him. But he had what the guayule project called for—the reputation for getting a job done.

They say that when Kelley got the guayule call, he went to Salinas, California, as if he were going to a forest fire. At Salinas he took over the nurseries and plant of the International Rubber Company which had been experimenting with the growing of guayule as a home source of natural rubber, and began hiring people right and left. In no time at all the Salinas landscape was a beehive of workers. True to his reputation, Kelley got results. In mid-January last, a Forest Service operated factory at Salinas began manufacturing 600



tons of rubber from the older plantations started by the rubber company. Small though the amount, it is, according to the Service, the first natural rubber produced in the United States since the outbreak of war.

But Kelley's first and most important job was to grow more guayule seed in order to grow more guayule seedlings in order to expand field plantations. He exceeded expectations by turning in 180,000 pounds of clean seed last fall—enough to grow plants for field plantations of over 200,000 acres. Upon every phase of guayule growing he has brought to bear intensified research and modern methods with the result that the project has been constantly picking up speed and prospects of increased rubber yields at shorter growing periods.

Now comes the bearish aspect of the undertaking. President Roosevelt's new budget recently sent to Congress calls for an expansion of the work by \$56,000,000. If Congress approves, which seems likely in view of the bottlenecks in the synthetic rubber program, the Forest Service will be faced with the task of planting 170,000 acres of guayule annually and of building and operating a score or more of rubber factories. If the project is to assume this scale, Forest Service officials estimate it will call for a working force of fifty to sixty thousand men and women, which on the basis of the average personnel turnover of the past year means employing yearly 120,000 persons. And that is where the bear's tail looks shortest.

Marsh Rabbit

As this is written, marsh rabbit has just made the headlines in Washington. More than that, he has made the stomachs of a group of political dignitaries including Vice President Wallace, Secretary of Agriculture Wickard and Speaker of the House

Rayburn. Fifty strong, he came from the woodland swamps of Louisiana to be served up *a la Louisiane* at luncheon in the House restaurant on Capitol Hill. The object of his sacrificial mission was to demonstrate the part the marsh rabbit can play in helping to solve the meat shortage. Host and master of the occasion was Representative Domengeaux, whose State of Louisiana leads all states in point of marsh rabbit population.

Marsh rabbit, it should be understood, is no relative of bre'r rabbit. His real and common name is muskrat. It is only when he takes on table manners that he sloughs his real name with his skin and assumes a more appetizing soubriquet. Many who read of the Capitol Hill muskrat luncheon were shocked at the idea of eating this lowly aquatic animal. Some even thought the idea new. As a matter of fact the eating of muskrat is neither new nor shocking. Its meat has been eaten by trappers since early days and for years it has been available in many meat markets throughout the country during open seasons.

As long ago as 1925, for example, E. Lee LeCompte, recently retired State Game Commissioner of Maryland, reported large amounts of muskrat meat being absorbed by the markets of Baltimore, Philadelphia and Wilmington, and sold under the name of marsh rabbit. And hotels, restaurants and clubs were using thousands of pounds, serving it up as diamond back terrapin.

Those who know the muskrat in its native haunts say it is one of our cleanest animals. Its diet is largely vegetarian and the claim is made that it washes and rewashes every piece of its food. Whether one likes its meat appears to be a matter of personal taste. Devotees of the meat sometimes compare it to wild duck of the marsh lands. Those who turn noses up at it object to its slightly musky flavor.

But regardless of personal tastes and finickiness which are out of place in waging war, the annual take of muskrats for their furs represents a sizable supply of edible meat, much of which is now wasted. The animal is common throughout the country where streams and water provide necessary aquatic environment. He is a populous citizen and a prolific breeder. Millions of his pelts go into women's coats every year as substi-

tutes for seal and other more valuable skins. How many muskrat carcasses are thrown away after the animals are skinned by the trappers is not known but the number must also run into millions considering a total annual take of approximately 16,000,000 animals. A fair average weight for the muskrat is one and a half pounds which in terms of the annual take make an undressed meat supply of 40,000,000 pounds. Probably not twenty-five per cent is now marketed.

Two Letters

The appointment of Lyle F. Watts as chief of the United States Forest Service was heartily endorsed by the Board of Directors of The American Forestry Association meeting in Washington on January 21, and its action transmitted to Secretary of Agriculture Claude R. Wickard in the following letter, signed by the Association's executive secretary:

"The Directors of The American Forestry Association at their January meeting asked me to express to you their gratification at your recent action in appointing a permanent head of the Forest Service. They wish me also to congratulate you on your selection of Lyle F. Watts for the position.

"Mr. Watts is a man in whom we have the greatest confidence and his long experience and broad outlook, together with the esteem in which he is held both in and outside the Service, bespeak, we feel sure, a new era of public service in forestry on the part of the Department. To this end we hope we may have the privilege of cooperating with you and with him."

On February 9, Carl Hamilton, assistant to Secretary Wickard, replied as follows: "The Secretary asked me to thank you for your letter of February 2, and to tell you he was very happy to know of the high esteem in which you hold Mr. Lyle Watts. It is the sincere wish of the Secretary that the closest kind of cooperation exist between the Forest Service and all forestry groups, and he is happy to know that your group has confidence in the experience and ability of our new chief forester."

One Letter

A rare and rich heritage are the birds and animals of the forest — busy workers which contribute to the health, wealth and happiness of the American people



WILDLIFE IS WORTH FIGHTING FOR

By JOHN LINDSEY BLACKFORD



Expert tree surgeon is the white-headed woodpecker. Its fight against destructive borers and beetles gives health to the forest

WHEN we speak of preserving our way of life, we mean more than the Four Freedoms of the Atlantic Charter. We mean all of those things, inspirational as well as economic, which contribute to the happiness and prosperity of the American people. Wildlife, for instance. Though far too few of us realize it, these creatures of forest and field form a rare and rich heritage — one abundantly worth fighting for.

Consider the forest. Without its mammals, birds and insects, it would be like a city without people. And like the city, the forest requires the constant services of its dwellers to keep it in health and

repair. As for the woodfolk, they are critically dependent upon the forest for food and shelter. The Indian knew this, and so does the scientist, but Americans generally have failed to understand fully the relationship, the parentage, of the timberland to its creatures.

Most woodfolk are intimately associated with a certain type of woodland—a tree or shrub association. Furthermore, many confine their activities to a particular “layer” or zone of the arboreal cover—the *overstory*, the *undercanopy*, the *shrub stratum*, or the *ground growth*, to use the scientist’s terms. Finally, the *microhabitat* represents the last niche.

the ultimate local surroundings to which the individual is adjusted and by which its minor habits are formed.

Those whose business it is to study the relations of living things to their environment, look upon a forest, or plant society, with its inhabitants as an organic whole—a sort of multiple organism of a higher order than the individual. They have found that such complex communities display many characteristics noted in the single plant or animal. For instance, life communities “arise, mature, attain old age and die from natural causes or by accident.”

This, briefly, is the scientific view-



Golden-mantled ground squirrels live at timberline. Seed "planted" by them take root in the barren rockslides



The aristocratic ruffed grouse harvests seed and berries—and sows them again to perpetuate the green carpet of the forest

point. In the language of the layman it means simply that without the forest and its various elements certain wildlife would vanish; that without its mammals, birds and insects the forest would degenerate. In Nature's scheme of things, each one is dependent upon the other, and both join to form a balanced and productive community for our use and enjoyment.

No truer scion of the timber haunts its coverts than the white-tailed deer. Normally, a deer's habits are beneficial to the woodland, for average browsing prunes and thickens the undergrowth. But without control by predators, many herbivorous animals become destructive. The result is generally exhaustion of their food supply—and starvation.

When a sylph-like doe secrets her fawn amid high grasses of a mountain meadow, or in the shifting light and shadow of a piney hollow, she relies chiefly upon instinct deep-rooted within the race. Nature assists with the spotted coat she gives the youngster, but in its obedience and courage rest its real chance for survival. Through long hours this fawn remembers maternal warnings and makes no movement other than to breathe and, occasionally, to open liquid eyes tinged with the pale blue of infancy.

The golden-mantled ground squirrel, called "big chipmunk," but related to the true spermophiles, is a doorstep child of the forest. Its favored home is in the rockslides below timberline where grasses, seed-bearing shrubs and trees press hard upon the talus slopes. An acquisitive fellow, seed from its "planted" stores often take root to advance the bordering green up barren slides.

The habits of the ruffed grouse are intimately connected with the floor and undercover of the forest. It harvests the berries, seeds and nuts of many plants and sows them again to perpetuate the low green layer that carpets the underwood. Though wary and shy, the aristocrat of upland game birds is capable of closer acquaintance. How would you like, as I have been, to be bluffed in your own back yard by a parent bird that has taken possession of the shrubbery for her fledglings?

The white-headed woodpecker, an expert tree surgeon, is at home in the Cascades and Sierra from Canada to Southern California. How long would giant pine, hemlock, spruce and fir have survived without constant inspection and treatment by this industrious clan? No woodpecker drills merely to relieve the monotony of tree-trunk existence; it is always after a destructive borer, beetle, or ant that would shorten the life of its friend, the tree. Yet some gunners, still without appreciation of this important

role, shoot woodpeckers simply because they make a living target.

The song of the olive-backed thrush would be a sufficient contribution to any wood in which the feathered artist chooses to live. In the boundless fir forests of the Rockies, or the denser timberlands of mixed broadleaf and conifer, its swirling, spiraled song, poignant with golden overtones, is regularly heard. Yet the large toll of weevils, caterpillars and moths this thrush takes is of no small account in the survival of tree foliage. The red-eyed vireo is another busy caretaker of the leaves. This specialist, which destroys hordes of span worms, leaf skeletonizers and aphides, is so small that it is generally hidden from view. We only hear its song. Should we be fortunate enough to catch a glimpse of "greenlet," however, it is more than likely it will be reciting refreshing notes with an insect in its bill. Elms, oaks, maples, birches and aspen are particularly indebted to the vireo.

Probably no other inhabitant of the forest has been so maligned and misrepresented as the cougar. It never constituted a menace to pioneer hunter or trapper; only the stock raiser, who followed, had reason for complaint. Yet the pioneer's exaggerated impressions of "catamount" and "painter" largely determine our attitude towards the mountain lion. Today, however, wildlife management of primitive areas such as the Kaibab plateau in the Southwest would be glad for its return. It has been said there, where overabundant deer devastated a vast range, that no seedling aspen or other browsewood could be discovered for miles. Even the mountain lion has its niche in Nature.

Enter the leafy aisles of the forest with observant eyes, and you will notice striking similarities between its organized existence and our own ordered way of life. A majority of wild things have acquired definite skills; many are so specialized that they cannot readjust and survive after their world is altered by human activities.

You will find busy keepers of the forest floor—juncos, towhees and doves. Rodent burrowers do not neglect the soil. The second shelter-layer, the undergrowth, is well served. Pileated warbler, cuckoo, winter wren and chipmunk are among its notables. Higher up there are caretakers of the trunks and limbs; protectors of the foliage; and sweepers of the forest air, the flycatchers, night-hawks and swallows. Every wood has its nurseryman, its sowers, gleaners, distributors and consumers. Lowly insects, with winged and four-footed scavengers, toil at the disposal of its waste.

Yes, the wildlife of the forest, just as the forest itself, is worth fighting for.



Forest songster is the olive-backed thrush—also an active enemy of weevils and other destroyers of tree foliage



This cub mountain lion belongs to a much maligned race—but even he, as a predator, has his deserved niche in the forest

YOU CAN'T WIN WITH FIRE!

By ERLE KAUFFMAN

SOMETIME before March 1, ravenous tongues of flame, in all probability unleashed by careless citizens, will hiss through the greening forests to stab America's war production in the back. This searing destroyer of a critical resource will spark in the South, eat its way up the Atlantic Coast to New England, snake across the Adirondacks to feed upon the new forests of the Lake States, and, in a final summer splurge of catastrophic gorging, coil its seething tentacles around the great timber producing areas of the West.

It will strike in 200,000 different places, causing an average of 500 forest fires each day—one for every second you are at your desk or lathe. These fires, at a time when every log is needed to beat Hitler and Tojo, will consume around 2,000,000,000 board feet of merchantable timber. This is enough to

meet wood requirements for 20,000 Liberty ships. It is enough to construct 2,000,000 Army truck bodies. It is equal to a third of our 6,000,000,000 board feet timber production deficit of 1942.

Dirty, acrid smoke from these blazing forests will impede military and naval training. It already has robbed one Alabama air training base of 10,000 flying hours. Aircraft warning service in important coastal areas will be seriously affected. Patrol planes, hunting enemy submarines offshore, will be blinded. At sea and on land, war transportation will be slowed down, perhaps brought to a standstill at some points.

The western forest ranges, essential to our food program, will be scorched by flame, reducing forage available for cattle and sheep and impairing the permanent producing capacity of the ranges.

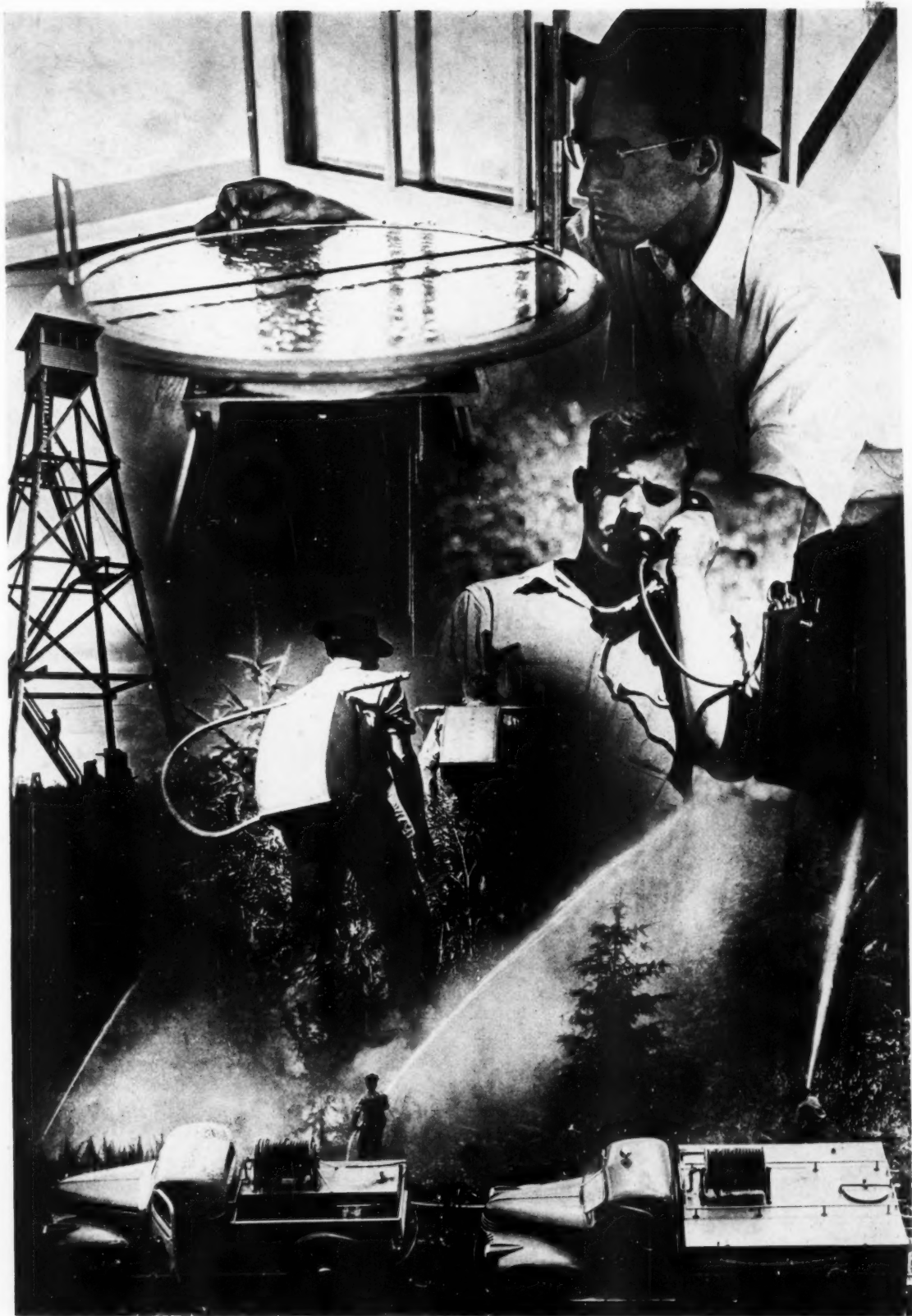
Power lines, turning the machines in war plants, will be endangered. Railroads, highways, communications, water and gas supplies, all vital to a nation fighting for its existence, will be threatened.

If this picture seems exaggerated, remember—it happened last year. It has been happening every year since man took over stewardship of the land. It will happen again in 1943 unless citizens and their government come to full realization that you can't win with fire, and mobilize against it with conviction and determination—the spirit of their struggle against the axis.

Because it is largely a monster of their own creation, citizens must form the spearhead of any offensive against this forest enemy. Their carelessness is responsible for eighty fires out of every hundred—more in some regions. The



Unless Americans do something about it, 200,000 forest fires—five hundred each day—will in 1943 destroy enough timber to meet wood requirements for 20,000 Liberty ships



The call for manpower by the armed services and industry has seriously depleted the nation's forest protective force. Well trained men such as these must be replaced



Women will stand guard in the fire lookouts—will serve as dispatchers, radio operators and cooks

critical need for timber and other forest products to wage total war has not lessened this tragic waste. To the contrary, the first war year witnessed the amazing spectacle of man-caused forest fires on the increase. The South was guilty of a fifty per cent increase in fires of this classification.

Just why Americans, who buy war bonds, labor long hours, and observe strict rationing with patriotic zeal, should deliver such a body blow to their own efforts is something every citizen must ask himself. It differs from sabotage only in that the act is not intentional. The result is the same—huge waste of a resource desperately needed to shelter, supply, and equip millions of fighting men, and a needless diversion of manpower from farm and factory.

If it is that they fail to grasp the true significance of burning forests, particularly at this time, nothing should stir them more than hard facts and blunt observations from the lips of men whose job it is to hold fast on the forest front. These men, on the eve of a new year of smoke and flame, are fully aware of the perils ahead, of the almost insurmountable problems to be faced unless the citizens of America also take up arms

Upon the youth of the country—sixteen and seventeen-year-old boys—rests the major share of the wartime fire control job. Here a young crew is in training

against fire. And this means more than moral support, more than an encouraging slap on the back. It means a patriotic resolve to eliminate the fires of carelessness and ignorance. It means active participation as volunteers in organized fire prevention and fire fighting.

On the basis of fire danger and potential damage to the war effort, three forest fire zones have been established for 1943. The first, and most critical,

is obvious. A single conflagration such as has been experienced time and again could send smoke billowing hundreds of miles out to sea, ideal cover for an invasion attempt should the enemy be so inclined. Also, much valuable war timber is being harvested in these coastal belts.

The second zone, only slightly less critical, embraces great timber producing areas in Washington, Oregon, Idaho and Montana, and the valuable pine and hardwood forests of the inland South. From this zone, and from some areas of the coastal belts, comes the great bulk of timber that is building ways in shipyards and barracks in training centers, that is boxing and crating the food and munitions, the airplanes and tanks, being rushed to distant battlefields.

Zone three takes in the hardwood regions of the Middlewest and Mississippi Basin, and also the high forests of the central Rockies. In this last area the major war job of the forest is to keep water flowing into the great reservoirs that supply power for industry, and to provide forage for vast herds and flocks of food and wool producers.

To guard these far-flung forest areas from the ravages of fire—the 180,000 caused by man and the 20,000 resulting from lightning—a well trained and equipped protective force, built around a network of federal, state, and private agencies, had been developed prior to Pearl Harbor. Today, this force is seriously depleted because of drain for the armed services and for war industry. At the same time, new sources for replacements are becoming increasingly scarce. As a result, a major share of the fire protection job in 1943 must fall upon the shoulders of sixteen and seventeen-year-old boys, women and older men. To complicate the problem, the number

(Turn to page 128)



spreads inland from the eastern seaboard from Maine to Florida, westward along the Gulf Coast to Texas, and along the Pacific Coast from southern California to Puget Sound in Washington. With the Nazis to the east and the Japs to the west, the importance of this zone



THE CASE OF WHITE PINE BLISTER RUST

By E. R. EDGERTON

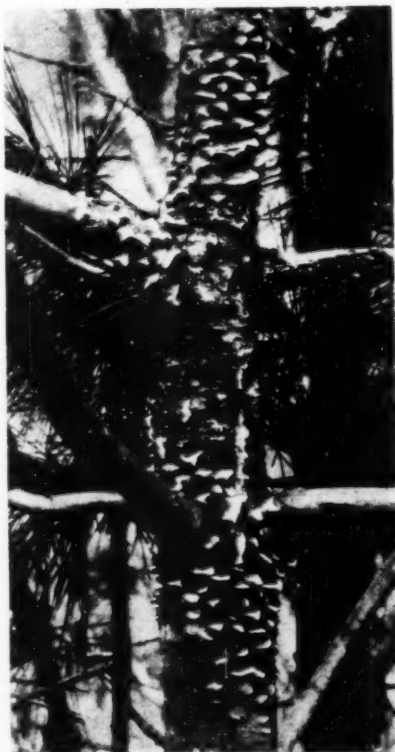
ALL the pine forests of Washington, Idaho, Montana, Oregon and California, ablaze and consumed by fire, would be less fatal to the future life of white pine than is the deadly, ever-present, always working spore of white pine blister rust. This disease is making tremendous inroads in young pine forests and unless the federal control program is greatly accelerated, the United States will sustain further serious losses to one of its most valuable timber resources.

The technical aspects of this disease have been described in previous issues of *AMERICAN FORESTS*, as well as in many professional forestry journals. There is no need to go over the facts again in relation to its nature and the results of efforts to control it. The writer has seen the effects of its unrestricted development, and he has seen the disease stopped by application of proper control measures—the eradication of the alternate host, wild currants and gooseberries. The purpose of this article is to evaluate the case of white pine versus blister rust in the light of a public citizen viewing the prosecution from the side lines. Having studied and observed the procedure in the Inland Empire—northern Idaho, northeastern Washington and western Montana—this analysis applies to this region alone, but the general picture may also apply to the sugar pine region of California and Oregon. White pine blister rust is likewise a problem in the New England States, the Appalachians and the Lake States.

The battle in the Inland Empire extends from the year 1923—and is still going on. During these two decades, the campaign for the preservation of white pine has had three definite periods of successes or reverses. The first, from 1923 to 1932, was a period of preparation and cautious advancement; the second, from 1933 to 1936, a period of outstanding progress and achievement;

The control of white pine blister rust was used by the President in his January 11 budget message to Congress to illustrate the necessity of maintaining "non-war" expenditures. He said, "Actually, the 'non-war' classification now has little, if any, meaning. Most of these expenditures are related to the war effort and many are directly occasioned by it. This 'non-war' category includes . . . such items as the control of white pine blister rust. Expenditures for controlling this threat to our timber resources are necessary to avoid loss of millions of dollars in lumber from trees which require more than fifty years to reach maturity."

Stampage value of white and sugar pine endangered is estimated at \$300,000,000. Value of young growth is incalculable. Around 28,000,000 acres are affected, 22,000,000 of which have received initial control work.



Blister rust at work, more deadly to white pine than fire

and the third, from 1937 to 1942, a period marked by reverses and a struggle against tremendous odds to hold the gains already made. An analysis of these three periods reveals a picture which warrants thoughtful consideration by public representatives.

Following discovery of blister rust in Vancouver, British Columbia, where, in 1910, it was inadvertently introduced through an importation from Europe of infected white pine, pathologists began a study of the control problem in the Inland Empire. The nine-year period following 1923 saw enforcement of quarantines to

prevent a more rapid spread of the disease by movement of its hosts; surveys were made to determine the scope of the problem of protecting the white pine forests; experimental work was undertaken to develop suitable control methods and to determine costs; and, finally, a local control project was initiated under a cooperative program in which funds were provided by federal, state and private agencies.

In view of the predictions made by pathologists as to what the disease would do and when it would become established in the Inland Empire, these first efforts toward its control were unduly cautious. Of particular significance in this connection was the forecast of S. B. Detwiler, now chief of the Division of Hillculture, U. S. Soil Conservation Service, but whose early work in blister rust control is well remembered, that by 1936 the disease would be generally established throughout the white pine areas of the Inland Empire. The writer recalls also the vivid description of the spread of blister rust in this region by Ovid Butler, editor of *AMERICAN FORESTS*, in a speech at Spokane in 1932. Mr. Butler had just completed an inspection of the Inland Empire, and his predictions as to the future rapid spread of the disease and the necessity for



In the Inland Empire, white pine is the backbone of the lumber industry. Its loss to blister rust would be an economic tragedy

prompt control measures have been borne out.

Pathologists stressed the importance of completing control work as soon as possible and efforts were made to secure the adoption of a program and funds necessary for its accomplishment. The reasons for such action were twofold: First, control could be accomplished at a much lower cost if wild currants and gooseberries were eradicated before the disease was present; second, fewer trees would be lost.

Unfortunately, an adequate program was not started during this period, despite the fact that surveys showed the 2,700,000 acres of white pine in the Inland Empire to be of sufficient value to justify the cost of control work. These values ran into many millions of dollars while the future potential worth represented in the development of existing young growth multiplied the stumpage values many times. At the end of 1932, accomplishments in control were: initial control work on 215,000 acres and re-

work on approximately 6,500 acres.

In 1933 there appeared a blessing in disguise for the case of white pine versus blister rust. This was the unemployment problem. With the inauguration of federal emergency work projects, government agencies supervising blister rust control were ready. Through the mediums of the CCC, PWA and WPA, thousands of men and boys were put to work in the forest.

Blister rust control benefited greatly in the first year or so of these emergency projects. Soon, however, demands were made for other types of work. As a result, fewer CCC camps were assigned to the forests of the Inland Empire; PWA funds under the National Recovery Act were not available for blister rust control after 1934; and the number of workers available under the WPA program fell off fifty per cent after two years.

During this period, from 1933 through 1936, the rate of progress in blister rust control was so great that it appeared the disease would be well in hand by 1940. With an average seasonal employment of 8,100 workers, outstanding advances were made. Initial control work was done on 1,405,000 acres, and rework performed on 70,000. This represented fifty-three per cent of the big job of initial control, and five per cent of the estimated cleanup work. Combining this four-year accomplishment with that of the previous decade, the initial job was sixty per cent completed and the cleanup task was about six per cent done.

But in 1937 the manpower engaged on blister rust control in the Inland Empire dropped to 3,900 workers, due mainly to diversion of relief workers to other projects. This level of employment was maintained each season through 1940. In 1941, however, there was a large decrease. CCC workers dropped to a mere handful; the WPA provided but 300. These were lost entirely in 1942.

This reduction came at a time when blister rust infection began to appear in serious proportions. Surveys and field studies revealed that about fifty per cent of the ground had to be reworked to establish complete control. In fact, portions of the vast acreage covered in the period from 1933 to 1936 should have been reworked in 1937. As it happened, most of the work from 1937 through 1942 was directed toward completion of control on areas where the work was started. Consequently, comparatively little extension into wholly unprotected areas was made. The past six years have seen initial control work on 258,489 acres and rework on 363,661. At the same time, more than 200,000 acres of mature white pine have been eliminated



White pine stands can overcome the effects of fire and logging, but these trees will never mature unless protected from disease

as not requiring control work for the protection of present stands.

Thus, at the end of 1942 the battle was more than half won. Initial control had been performed on more than 2,000,000 acres; but 585,000 acres remain wholly unprotected. This means that the initial job is seventy-eight per cent completed. With rework performed on 440,000 acres, this job is about thirty per cent done. According to the rate of progress in the past three years, an additional fourteen years will be needed to complete the initial job.

This, however, is something of a paradox. Long before these two decades are past, there will probably not be sufficient healthy white pines on the unprotected areas in this region to warrant the continuation of a blister rust program on the present scale. Already it has become necessary to determine the amount of blister rust present in order to determine the feasibility of initiating control work. Large areas totalling tens of thousands of acres have been eliminated from the control areas because the white pine therein is so badly diseased that it cannot be saved. The program needs to be doubled in scope in the near future to prevent further significant losses in the white pine type.

The final answer to the case of white pine versus blister rust in the Inland Empire lies in the extent of federal support. Thus far, blister rust control in this region has been largely financed by allotments under emergency work projects. The WPA and the CCC are now out of the picture. The question is, then, will the federal government continue with a job that is well on the road to completion? — a job that needs to be done on its own lands? Or will it leave state and private lands stranded, after state and private interests have spent their own funds, small but significant, in the campaign to preserve white pines for the future?

It is not feasible for the large number of small land owners to undertake protection of their own lands. To be effective, control must be carried on in an entire drainage. The private owner stands to lose little of his mature timber, but this land may become unproductive for the future. A second crop of white pine is out of the question without protection from blister rust. The owner has no financial interest in this second growth; the stands are chiefly valuable for future public welfare and the economic stability of a large territory. The reversion of these second growth private lands to public ownership is already taking place.

The need for control is now. To wait for cooperative effort from private sources, which is not sufficient by virtue of the technical and economic phases of



During the era of the CCC and WPA the fight against blister rust was almost won. It can still be won by an adequate control program

the problem, will see an irreplaceable loss sustained by communities and by the nation as a whole. The campaign needs a coordinated attack calling for immediate public support for the protection of a natural resource of national importance. The public interest is entitled to the protection of a large public investment already made.

The final chapter in white pine versus blister rust in the Inland Empire, as well as in other white pine regions of the country, will be written in the action taken by federal and state legisla-

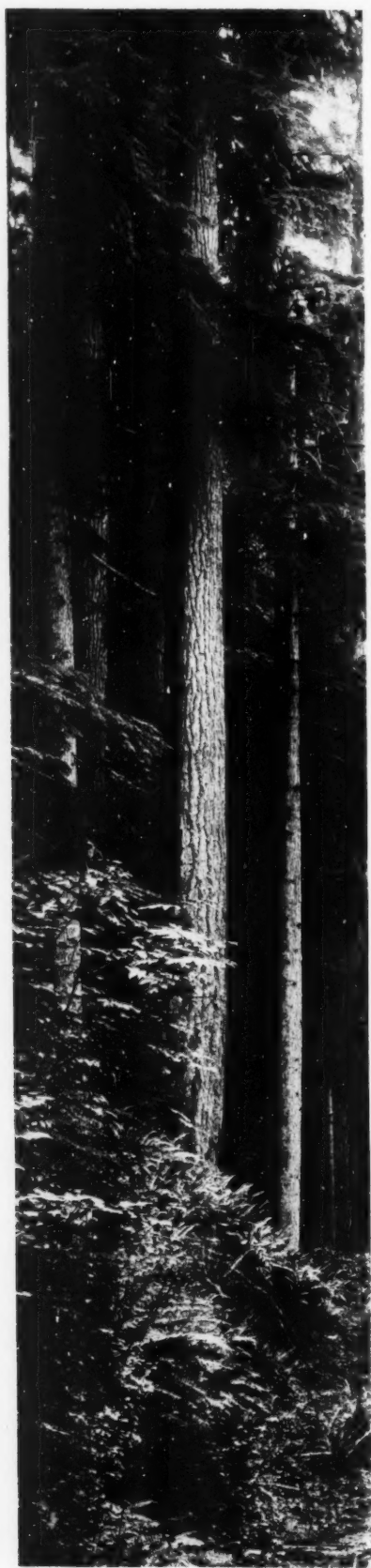
tive bodies. In the nation's valiant efforts toward winning the war, it cannot afford to lose sight of all its enemies, whether they are dealing destruction with bullets or with spores.

Control of fire and blister rust must continue in 1943 to prevent great financial loss. Blister rust crews located in the white pine forests are close at hand to assist in forest fire emergencies. The dual purpose of these crews is of vital importance during the war emergency in attacking the two worst enemies of white pine—fire and blister rust.



Blister rust control is achieved by the eradication of the alternate host, wild currants and gooseberries. Here is how it is done

THE NATIONAL FORESTS



Vigilance, today more than ever, is the watchword of the forest ranger

WHEN the first enemy incendiary bomb to fall within the United States landed in the Siskiyou National Forest of southwestern Oregon, a Forest Service lookout was on guard to spot and report the unidentified plane. Later, after he had located and reported the fire started by the bomb, he helped other Forest Service men put it out.

Depicting action as prompt and final as that described in the terse report that will go down in history—"sighted sub, sank same"—the Siskiyou Forest incident illustrates the readiness of America's national forest system to serve the nation in time of stress.

Our national forest system, which began a little over fifty years ago, now includes 160 national forests with a combined area of more than 177,000,000 acres in forty states and two territories. Administered by the Forest Service of the U. S. Department of Agriculture, the national forests have been managed under a multiple-purpose plan which looks to production of timber, protection of

watersheds, orderly use of range forage, maintenance and development of wildlife, development of opportunities for outdoor recreation, and other public benefits and services. Important in peacetime to the local communities and to the nation, many of these functions take on added importance in wartime.

Naturally, wood looms large in the picture of global warfare and the national forests are responding with alacrity to Uncle Sam's heavy wartime demands for timber and more timber. During the pre-Pearl Harbor defense period the volume of timber cut on the national forests climbed steadily upward, and since Pearl Harbor it has kept on climbing. Slightly more than 2,200,000,000 board feet were cut in the fiscal year 1942, a seventy-one per cent increase over 1939, and an all-time high for these public timberlands.

Large areas of national forest land had been severely depleted by destructive cutting or repeated burning before they came into public forest status and

AMERICAN FORESTS

AT WAR

By C. M. GRANGER

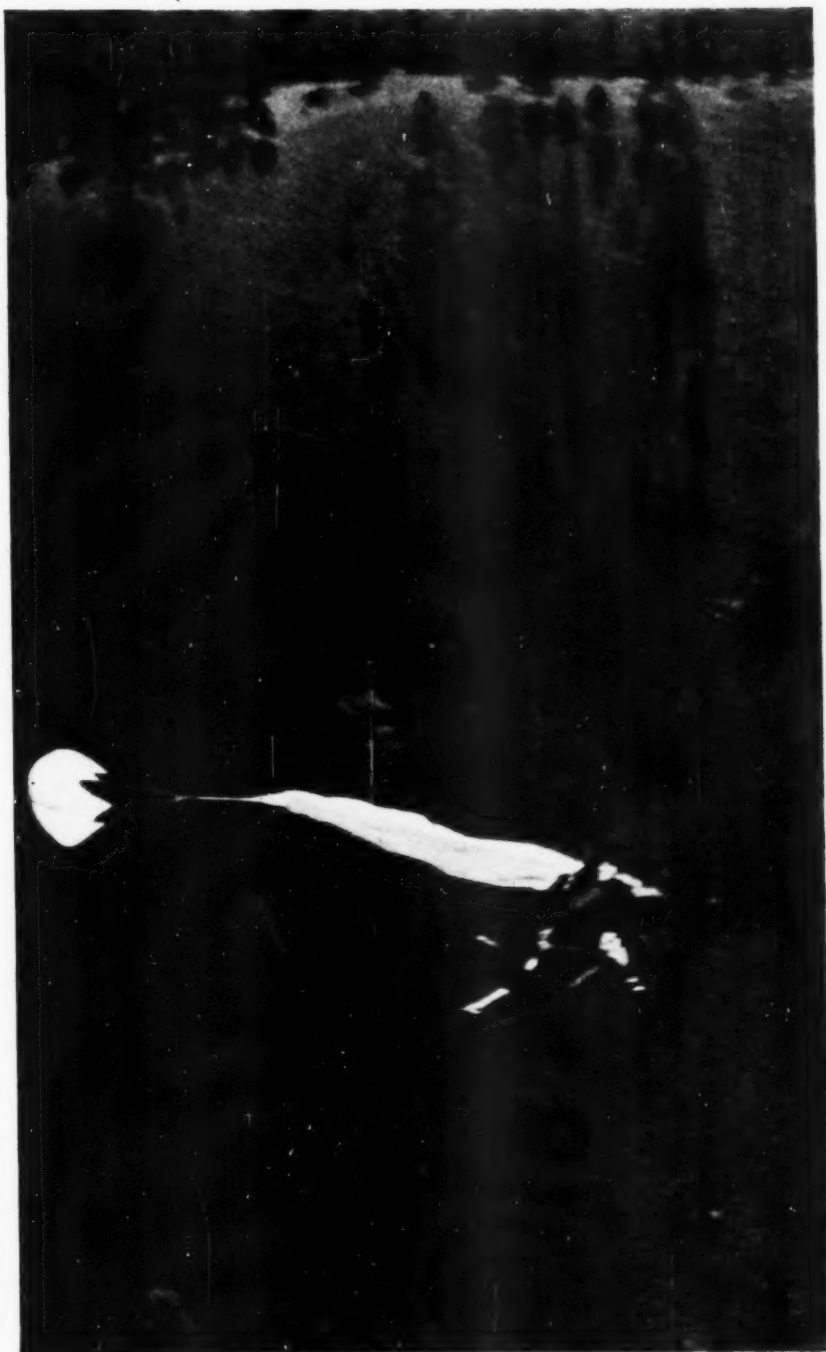
the Forest Service had a huge job of rehabilitation to do in restoring them to productivity. The results of protection and scientific forest management are apparent, however, in the fact that some of these lands, acquired only a few years ago, are now contributing in substantial measure to the war needs for wood.

Under pressure of emergency, the Forest Service has modified some of its regular procedures in order to speed up timber output from the national forests. The period of advertisement of timber sales where competitive bidding is required has been shortened from a minimum of thirty days to seven when war needs call for immediate cutting. Marking practices in some stands of old-growth timber such as red gum, suitable for veneer, have been modified so as to mark virtually all high quality trees for cutting; heretofore it was a policy to mark timber suitable for veneer in such a way that the benefits to local communities of timber cuttings could be spread over longer periods.

The Forest Service has made timber sales in excess of normal sustained yield limitations where forest products were especially needed to satisfy wartime requirements. However, overcutting to the point of preventing or impairing future timber growth has not been and will not be permitted; the Forest Service knows that destructive practices are not necessary in the national forests nor on any other forest lands in order to meet war needs.

To open up new supplies of timber, provision has lately been made, by Congressional authorization, for new access roads. Thus far, twenty-five such road construction projects on the national forests have been approved and are under way. Others are contemplated. Those approved call for the expenditure of \$1,370,000, permitting access to more than 15,000,000,000 feet of timber, which is expected to increase the annual cut by about 300,000,000 board feet.

A large-scale project to increase supplies of urgently needed aircraft lumber was launched by the Forest Service in 1942, with the support of the War Production Board. The project calls for logging high quality Sitka spruce in the Tongass National Forest of Alaska. The logs will be rafted 900 miles to mills in the Puget Sound area, a job involving many difficulties and risks. The first of these rafts, containing 1,000,000 feet



On the front line in western forests is the parachuting fire fighter

of spruce, arrived safely on January 15, and it is hoped that a monthly schedule of 10,000,000 feet of high-quality spruce can be achieved.

Yet wood and wood derivatives, important as they are in the war effort, are only a part of the national forests' contribution toward winning the war. Western forests, particularly, are also furthering the food for freedom pro-

gram. The grazing of domestic livestock on national forest ranges in the western states is a vital factor in the production of meat, wool, and hides to meet war needs. About 80,000,000 acres in western forests, open to grazing under permit, are used every year by ranchers and farmers. During the past year more than 1,000,000 cattle and nearly 5,000,000 sheep, not counting young stock,



National forests are contributing to the training of America's fighting men. Here mountaineering troops condition in Colorado

were grazed on national forests in Continental United States.

Improved range management has helped to increase the calf crop and the

average weight of new-born calves. The mistakes of World War I, due chiefly to over-expansion, will not be made again. Ranchers now realize that the



Millions of cattle and sheep graze on the western forest ranges—a vital factor in meeting war needs for meat, wool and hides

patriotic urge for greater production fell short of its goal when large areas of western range were over-crowded, instead of keeping the herds in balance with the forage supplies. In the national forests, good grazing practice is now developing more pounds per animal to help supply meat for our soldiers and allies.

Meat-eaters on the home front had a chance to supplement their wartime supplies with wild game from the national forests during the hunting season. It has been estimated that the annual increase of deer and elk alone in the national forests could provide the equivalent of a year's liberal meat diet for 225,000 people without reducing the size of the herds. Since game meat may be canned, smoked, salted down and cured the same as beef or pork, it can be kept and utilized over a long period of time. Forest officers also are cooperating with state game authorities in a program to salvage for war uses the hides of deers taken by hunters.

National forests are not only contributing essential wartime supplies—they are helping to train our fighting men. Nearly 1,000,000 acres of national forest land in seven states, Alaska, and Puerto Rico have either been transferred to the War and Navy Departments or made available through cooperative agreements for use by the armed services as sites for camps, artillery ranges, maneuver areas, and proving grounds.

The Holy Cross National Forest boasts a large training camp for mountaineering troops. Located high in the Rocky Mountains of Colorado, it has been named Camp Hale, in honor of the late Brig. General Irving Hale of Denver, who helped found the Veterans of Foreign Wars. The cantonment is perched at an altitude nearly two miles above sea level and is surrounded by lofty peaks where snow lies many feet deep—ideal training ground for ski troops. Forest officers have been of material aid to the Army in the recruiting and training of these mountaineer units.

War brought greatly increased danger to the forests from fire, and special protection measures were launched to meet the added hazards. In some of the national forests, closures of certain areas were necessary to safeguard strategic facilities or reduce hazards. With so many trained fire-fighters joining the armed services or diverted to other essential work, all forest protection agencies had to rely largely on civilian volunteers for fire-fighting crews. In the Northern Rockies and Pacific Northwest, national forest officers trained leaders for the organization of 36,000 local volunteers for fighting forest and grass and stubble fires. In California, inmates of

San Quentin Prison and other state penal institutions were trained as fire-fighters. Similar cooperative services were used elsewhere. With a Forest Service officer as national coordinator, the Office of Civilian Defense is now organizing a nationwide Forest Fire Fighters Service of volunteers to aid federal, state, and private forest protection agencies in the war emergency.

For some time federal lookout stations on many of the national forests and cooperating state forest lookout stations have constituted an important part of the Army's extensive aircraft warning system in the event of an enemy attack from the air.

Thirteen camps for conscientious objectors are located in national forests. Activities undertaken by men at these camps include fire pre-suppression work, construction of administrative improvements, reforestation and forest stand improvement, and, when fires break out, the C.O.'s serve as first line fire-fighting crews.

Many of the important deposits of strategic metals vital to prosecution of the war are located within national forests, and new mines for such essential materials as fluorspar, lead, zinc, chrome, and tungsten are being or have been opened on the national forests. The Forest Service is constructing or improving forty-five roads that will provide access to deposits.

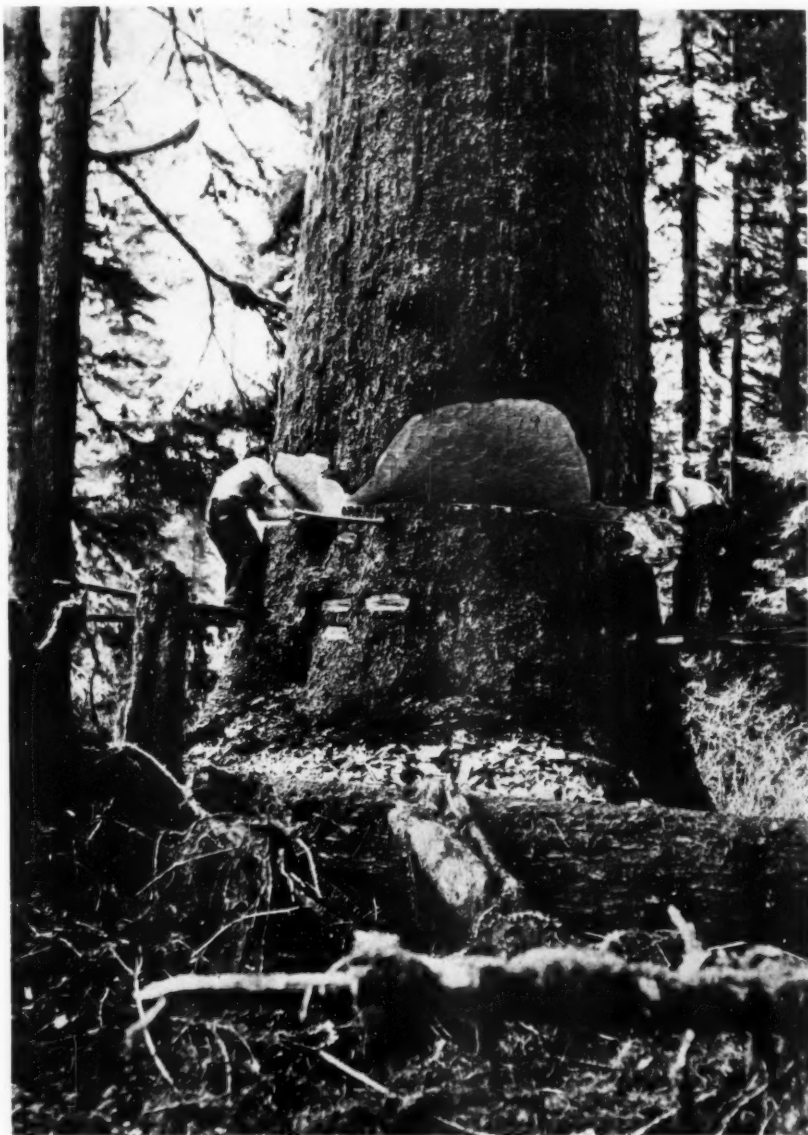
Important chrome deposits in Montana and California national forests are among the mineral resources to be tapped by the new roads. The Arapaho National Forest, in Colorado, is the site of the world's greatest producing deposit of molybdenum, the magic steel-hardening metal.

Many families have the national forests to thank for the fuelwood that is keeping them warm this winter. As soon as definite shortages of coal and fuel oil for home use in certain areas were in prospect, the Forest Service encouraged more widespread cutting of wood for fuel. With the cooperation of state forestry authorities and state extension services, efforts were made to stimulate the cutting of cordwood in line with good forestry practices. In the national forests, permits are issued for fuelwood cutting—many of them free for the salvaging of dead timber.

Turpentine and rosin are important in the war effort, and national forests of the deep South are contributing to the wartime naval stores supply. When estimated requirements for 1942 naval stores were placed at a figure fifty-eight per cent above 1941 production, Forest Service research men redoubled their efforts to get more turpentine and rosin from southern pines. For some time foresters at the Olustee Experimental

Forest, in Florida, had been trying out acid solutions to increase gum flow. It was found that a forty per cent solution of sulphuric acid, when applied directly to the fresh streaks immediately following chipping, produced a definitely increased yield from slash pine. Some operators cooperating with the Forest Service in large-scale tests got as high as a sixty per cent increase in gum flow.

The 1942 crop of pinon or pine nuts from southwestern national forests played a small but useful part in the food for freedom program. Pinon nuts, ranking high in food value, are harvested in national forests and other areas in New Mexico and Arizona, and in parts of adjoining states. Ordinarily the total pine nut crop for the Southwest is worth from \$250,000 to \$500,000 a year.



Sitka spruce is urgently needed for aircraft production—and this giant on the Tongass National Forest, Alaska, is on its way

This method means quite a saving in labor, because it increases the yield without having to bring more trees into production. The Forest Service at the present time is working out improved acid stimulation techniques that may give even better results in another year.

With gasoline and tire restrictions and other wartime factors limiting travel, recreational use of some of the national forests dropped off materially. But in forests near the greatly expanded centers of war industry and military training (Turn to page 138)

EASTWARD TO CHINA

Adventures of a Noted Soil Explorer on a Mission to Chungking

By W. C. LOWDERMILK

In 1942, the Honorable Hu Shih, Chinese Ambassador to the United States, handed me a paper bearing the name and seal of Generalissimo Chiang Kai-shek. It was an invitation to come to Chungking and assist the great Chinese people in the formation of a Soil Conservation Service and to develop among them a new attitude toward the use and maintenance of their land resources. Happily, I accepted, for the soil problems of China have been a source of great interest to me and the years previously spent there in study and observation were among the most enlightening in a long career as a soil conservationist.

Normally, by Pacific Clipper, the trip from Washington to Chungking would have required six and a half days. But there was nothing normal about travel in the late summer of 1942. You journeyed by whatever means were available. So, after considering the routes open to me, I booked passage on the Atlantic Clipper. I would travel eastward to the ancient land of the Chinese.

That I was embarking upon a long and uncertain trip was evident—how long and uncertain I was to learn later on. The opening of a second front in North Africa, though I did not know it at the time, brought about a sudden cancellation of my passage by Clipper, and started me on a 16,000-mile sea voyage to Capetown, South Africa.

At Capetown I was no nearer my ultimate destination than I was at Washington, had I been able to fly direct. There still remained the long journey to Cairo, Egypt—8,000 miles, or seven days of daylight flying. Then by plane over Palestine, the Syrian Desert, Iraq, Iran, India, Burma and into China.

It is in Cairo, in late November, that this is written. Thousands of miles still lie ahead of me. Yet I have been voyaging for many weeks. Looking back, the month and a half at sea, beginning in our own dangerous waters under escort of fighting ships, stand out as the most exciting, and in many respects the most

perilous. But it was Africa, from Capetown to Cairo, that intrigued me most. After all, I am a landlubber, primarily interested in the soil and its service to man.

In fact, I found the ocean the most desolate desert I have ever studied. It is lonely and merciless, majestic and mysterious. Everywhere are restless, heaving, sagging waves. The sun comes up and goes down, the stars come out in a black sky, and weeks seem like months. The only land lay fathoms beneath us. For weeks we did not see another ship along our lonely course.

During part of the trip gales raised the blue-black waters into what the second mate called a "lumpy sea with a heavy swell." We pitched and rolled and wallowed. Everyone was ill. I lost everything but my appointment to China. Up until then the trip had been uneventful.

The roaring seas calmed somewhat, but later the winds whipped up again, becoming cyclonic. It was frightful. All the sea within the circle of the horizon was a writhing mass of mountainous waves that rose to plumes of white spray, striking out at the sky in leaps of wave crests. We fought on, being flung this way and that, until finally the captain said it was about over—that we had escaped the worst part of the storm. Personally, being a landlubber, what we had will suit me for a lifetime.

W. C. Lowdermilk, distinguished soil explorer and assistant chief of the Soil Conservation Service of the Department of Agriculture, is now in China, at the invitation of Generalissimo Chiang Kai-shek, to assist the people of that courageous country produce more food for their fighting millions and to help make secure the soils of an old but constantly living land. One of his endeavors will be the establishment of a Soil Conservation Service for the Chinese Government.

Unable to cross the Pacific because of the war, Dr. Lowdermilk, who has studied the lands and peoples of many nations, including China, traveled eastward to Chungking—by boat to Capetown, South Africa, then by plane to Cairo, Palestine, Iraq, Iran, India, Burma and China. Here is the story of the first part of this dramatic trip—from Washington to Cairo, a distance of 24,000 miles—and some significant observations on the relationship of soil to mankind while enroute.—Editor.

The albatrosses adopted us. These marvelous birds followed astern, wheeling in big figure eights without a single flap of their great wings. Their ability to poise on the air currents was so uncanny that I devoted hours to watching them. They were joined by smaller birds, a species of pigeon, which were even more remarkable in their ability to glide hour after hour. With ease and grace they would glide against the wind, without so much as one flap of their wings, faster than our ship could travel. Truly, these pigeons are the most perfect flying machines I have ever seen.

Between the storms and the hours devoted to observing bird life, I gave much time and thought to land use problems. The task ahead of me was great and I was fully aware of its possibilities and opportunities. We, the American people, have a chance of a thousand years to take leadership in working out a better relationship between man and the land. For 7,000 years the march of civilization has been on an ever accelerated program of exploitation. Except in a few places, like the Jewish agricultural colonies in Palestine, peoples are not adapting themselves to their resources in a manner which maintains the productivity of the earth and creates for themselves cultural satisfactions and security without exploitation of others less fortunate.

We must find the way, and show others convincingly, that the welfare not only of China, but of our own country, is linked to the principle of conservation—of material resources of the Holy Earth, as well as of human resources. In doing specific and creative tasks on the land, where we can feel with our hands and see with our eyes and understand with our minds, we can work out the larger principles that must pervade the whole of civilization to conserve the resources of mankind—the spirit of peoples and their hopes for security and liberty.

In South Africa, where we finally dropped anchor after winding through mine fields. I was given the opportunity

of examining many land areas in detail. Particularly was I impressed by the region around Escourt, Natal, where the Forestry Department is planning a forest influence experiment station. This country reminded me of Arizona, though it is better watered. The vegetation is the same and the physiographic history has many similarities. It was spring there and the landscape was green, with blue mountains in the distance and, in the foreground, red soils exposed by cuts and gullies. Erosion is taking over rapidly just as it did in our own Southwest.

Before leaving by plane for Cairo, I was able to spend one full week making a cross-section of the Bergveld, or highland area above 6,000 feet elevation, down across the Sourveld, the long-grass region, and into the Thornveld, a dry land or brush country, 1,000 feet above sea level. This includes rainfall from fifty to fifteen inches, and it is in the lowest rain belt that most of the erosion occurs. Vegetation there is thinner; the land is overgrazed, often the year round; and natives do a lot of patch cultivation under conditions that in many places are crowded. Most of the land users are so close to their immediate concern that they fail to comprehend the trends in the present situation. But this seems to be an almost universal failure.

The existence of "labor farms" complicate the situation in this region. Landowners permit natives to live on their estates, build their grass-thatched kraals and cultivate plots of ground in return for being available six months of the year to work on the huge properties. Unfortunately, the natives were congested far beyond the normal carrying capacity of the land on all of the labor farms I visited. Soil erosion is set in motion by cultivation of slopes and by overgrazing of their stock. On one area all soil had been washed away from three-fourths of 3,000 acres. Most of it was cut by gullies into underlying shale rock.

One wonders if the human race will ever learn to adjust itself to Mother Earth intelligently for the long view. I feel now more than ever that in the new world order which is to be established at the close of the war, the peace settlements should include a world-wide policy for erosion control and conservation of natural resources. Not only should this policy be fostered, but it should be required so that the conservation of soils and water and natural resources may have the vital recognition and assistance it deserves as a benefit to man and as a preventative measure against future wars. Only in conservation can nations build up the carrying capacity of the earth for future genera-

tions and provide security and a better way of life for those who toil.

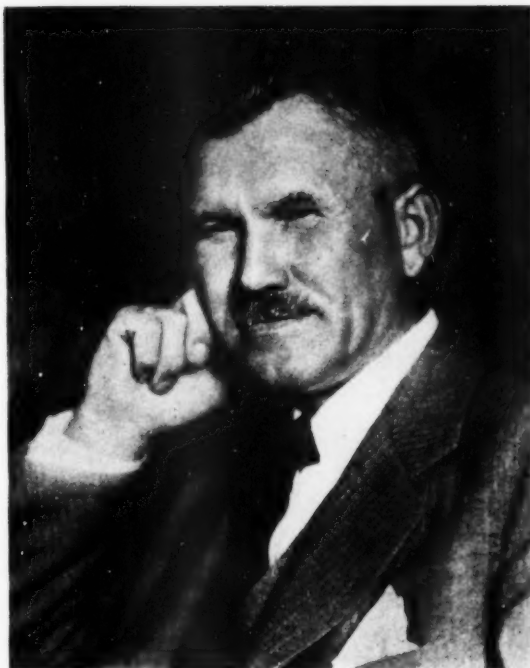
Anxious as I was to continue my studies of this part of the vast continent of Africa, the task before me was in China, still thousands of miles eastward. So, at sunrise one day, I boarded a great flying boat and winged above scattered clouds on the first leg of an 8,000-mile journey to Cairo.

For miles we roared over a desert type of country which reminded me of western Texas. Native kraals and huts with thatched roofs, not unlike the Navajo hogans, were scattered below. Near many of these, among scrubby trees, were patches of ground irregular in shape, cleared for cultivation. Some fields were abandoned because of soil erosion; others were in crops. Elsewhere we saw the clearing process for new patches, with fire, wriggling spots of red, consuming the brush. All of this was in a wild country without roads.

At the muddy mouth of the great Zambezi River, spreading over a vast area, we dropped down at Beira. It is a large port with docks and cranes to handle freight to and from Rhodesia. But it was too hot amidst the unwholesome mud flats, and we were glad to take off again for the skies.

Mozambique was one of the really remote places of the earth until seaplanes made it a regular stopping place for the night, for all flying in Africa is done during daylight. The following day we flew for 1,300 miles to Dar Es Salaam, a Mohammedan name from days of Mohammedan slave traders. Thence along the Equator to Lake Victoria where we stopped at the capital of Uganda. This lake is a vast body of water 150 miles wide and 250 miles long, and lies at an elevation of 4,000 feet. Although the Equator runs through it, the air is cool and dry.

It was in this general region, while flying at low altitude, that I frequently saw rhinoceros, giraffe and other animals scurrying to hide in the brush. But of greater interest to me were the fine networks of game trails. These were red against the gray-green of the vegetation. I also noticed that after a heavy rain the washing of the deep red soil caused streams to run red; ponds of red water



Walter C. Lowdermilk

were common. Further inland, on a higher section of the plateau, sheep and goats were observed grazing in herds. And seldom have I seen land so badly eroded from overgrazing. It was a terrible sight. Near Lake Victoria was an extensive area of native kraals and farming where stripping as a means of dividing fields had been adopted. Unfortunately, this stripping was up and down slope, so that erosion was taking its toll. Fully twenty per cent of the fields were abandoned and long shallow gullies were in evidence. However, the lay of the land is very desirable and the red soil is deep. The country shows wonderful possibilities of making a type of cultivation that we would like to see throughout the world were there people with vision to carry it out.

We stopped near the Blue Nile just above its junction with the White Nile to form a river which has affected human civilization as much as any other river of the earth. And here I sought a few moments of solitude, beside this ancient stream, to ponder the mysteries of an age-old land.

In the quiet of the evening I heard the rattle of oars, muffled in wooden locks. Nearby a Mohammedan was going through his prayer, facing Mecca. Across the river the earthen bank rose twelve feet above the water's level and flattened away into a flood plain. There on the ancient bed of silt built up by floods through many thousands of years,

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THE INDIAN-WORKER IN WOOD

By SIGMUND SAMETH

THE next time you place a log in your fireplace remember that in some parts of the world wood is too great a luxury to be burned. The Eskimo, for instance, hoards wood jealously. His sole supply is eked out of scrubby brush and occasional driftwood cast up on the beach. For an Eskimo to burn a stick of this driftwood would be equivalent to a New Yorker lighting a cigarette with a ten-dollar bill.

No raw material of nature is more universally used than wood in its many forms. There is not a single primitive tribe which does not possess at least a rudimentary woodworking technique. In this country centuries before the white men arrived native tribes of Indians and Eskimos had already worked out methods of joining, splicing, binding, lashing, pegging, grooving, and even sewing wood. In making receptacles out of birchbark, a process resembling dovetailing was used. True, American natives had never discovered the useful mortise and tenon joint, but clever substitutes had been found. Alaskan houses were built with frame timbers as large around as a man's body. Worked sockets were used in joining. In the Navajo dwelling hut, or *hogan*, crotched supporting members served the same purpose.

It is a tribute to man's ingenuity that the greatest wealth of woodworking technology was often present in areas least adapted by nature to foster such art. The Eskimo of the treeless Arctic regions was perhaps the most skilled craftsman of all. Working with materials an American carpenter would consign to the scrap heap he turned out harpoons, lances, bows and arrows, fire drills, household implements, snow goggles, kiyak frames, clothes dryers, and even thirty-foot sledges fashioned entirely out of driftwood gathered during the years.

It's no trick at all to manufacture a harpoon shaft if the proper length of straight, knot-free wood is available. The problem becomes a real engineering feat when the raw materials consist of short gnarled lengths of juniper, hacked laboriously from the hillside. To scrape these down to proper diameter, gently bend them straight with fire and muscular effort, then splice the completed shaft until it is one well balanced piece—that is woodworking of the highest order. To the Eskimo it is an everyday task. He'd be completely baffled

by a single piece of wood of the requisite length since he's used to working with scraps.

Straightening crooked lengths of wood is one of the most common operations which the primitive woodworker is called upon to perform. Different American Indian tribes attack the problem in differing ways. In the Southeast, where the Cherokee and Choctaw made blowgun darts and arrows out of sharp pointed reeds, a "mass-production" method was necessary. Accordingly, Indian braves gathered their reeds into huge armfuls, bound them together with thongs, then suspended them from a limb with a heavy weight hanging from the bundle's lower end. In this way huge quantities of darts were easily prepared and they dried out with a minimum of warpage.

In the Great Plains area, the Sioux and other buffalo hunting tribes used a more permanent type of arrow with a flint point. These arrows were retrieved whenever possible and more care was expended in fashioning them. The wood selected was often willow. It was shaped

by scraping. After it dried out the shaft was polished by rubbing with a grooved piece of coarse sandstone. Animal grease was next rubbed into the wood to prevent brittleness. Finally, it was given a straightening treatment by being warmed over the fire, carefully sighted lengthwise, and bent gently to conform with the ideal shape.

To facilitate the straightening of large hunting arrows a buffalo rib "wrench" was used. By placing the nearly finished shaft in a hole in the end of the "wrench," greater leverage for applying pressure was possible. Archeologists have uncovered arrow-straightening "wrenches" which date from the very first years of the Indian in this country. In prehistoric Europe a similar tool was used.

If such pains must be taken in forming a mere arrow shaft, how much greater effort must be expended in making the bow. In this respect the American Indian tribes were fortunate in possessing the osageorange, the best bow wood that has ever been found. The early French *voyageurs* were so im-



Like their forefathers who fashioned bows and arrow shafts, present day Indians are expert craftsmen in wood

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pressed with it, in fact, that they renamed the tree *bois d'arc*, by which name it is still known in the Midwest today.

Osageorange is extremely tough and supple. Once the proper "blank" for a bow was cut to shape, Indian craftsmen brought it down to its final form by scraping rather than using cutting tools. The reason was a sensible one. By scraping the wood, fibres were followed instead of being cut across. This more tedious process yielded a bow stave of greater strength even though it might be more irregular than one which has been neatly trimmed with a knife.

Most of the tribes in what is now the United States managed to secure enough of the precious wood for bow-making purposes. It was carried and traded for hundreds of miles. Sometimes an entire war party set out for a distant region where *bois d'arc* was known to be had. In the case of tribes in Northern Canada and the Arctic littoral, weaker types of wood had to be utilized. Here again ingenuity found a way. The tough back sinew of the caribou was easy to get. By preparing a glue of boiled hoofs and hides, or in the case of one of the Pacific tribes a fishskin glue, the sinew strip could be attached to the outer side of the bow stave. By whipping over the sinew it was incorporated permanently into the bow. Its toughness made up for the lack of resiliency of the wood.

One of the most spectacular American Indian uses of wood were the huge totem poles of carved cedar erected along the north Pacific Coast from Vancouver Island to Alaska. These monuments, some of which have endured for centuries, commemorated the family history of the owner. A special class of totem pole carvers fashioned them and were paid handsomely for their work. They worked in secrecy, often taking months to complete a large pole.

Wood technology was generally well developed on the north Pacific Coast. There was an abundant supply of straight grained timber easily split and worked. The principal means of felling timber were fire, the stone ax, and the wedge. With primitive methods such as these and plenty of willing manpower, the largest trees could be felled and cut up into the requisite lengths. Some tribes in the Oregon area used still another method. With a battering-ram armed at its end with a chunk of jagged flint, successive rounds of wood were bruised off the tree. What a shout of exultation must have gone up when some monarch of the forest finally shook and tottered.

For house building it was necessary to split the logs into boards. Antler or stone wedges were most often used.

Much of the amazing resistance to rot of Indian built structures in the Pacific Northwest is attributed to the fact that boards were split rather than sawed. Water seems to penetrate less when the grain ends are left intact.

In making large log canoes, fire was often used in the hollowing process. The log was placed on trestles for easy working. Its upper surface was flattened with stone adzes. Fires were kindled nearby and hot coals were transported to the canoe log, allowed to burn, and replaced when they went out. Gouging and chipping with hand tools went on apace. Gradually the combined agencies of fire and human musclepower brought about the required degree of hollowness.

American Indians never invented nails. True, they made a limited use of the peg in joining, but the most common method was lashing. Anyone who has seen a piece of green rawhide contract on drying must be convinced of the strength of a lashed joint. The amount of tension developed is far greater than that which even a powerful man can bring to bear on a joint lashed with rope or string. Moreover, the rawhide lashed joint is never completely rigid. It will give slightly under strain, spring back into position when the strain is removed. After the Eskimoes were introduced to the hammer and nails, a few rugged individualists tried the newer method in building sledges. They soon went back to the rawhide lashings, however, since a rigidly nailed sled soon bangs apart when driven over bumpy ice.

Anthropologists were incredulous at the extent of housebuilding activities in pre-Columbian America. Was it possible that native tribes could have built up cultures with such extensive use of wooden structures? Almost daily it seemed, archeological expeditions were uncovering new ruins of what had once been flourishing Indian villages. In the Southwest pueblo roof beams thousands of years old were dragged into light; along the Missouri drainage Mandan earth-covered lodges eighty feet in diameter were excavated; in the East an Iroquois long-house large enough to accommodate several railway cars was found. Every one of these monumental structures dated back prior to the introduction of steel and iron tools. In fact the only metal which the American Indian had in any quantity was the soft native copper of the Lake Superior region which was more prized in making ornaments than as a material for tools.

Officials in New York's Museum of Natural History resolved once and for all to solve the secret of the Indian's woodworking technique. There were thousands of flint adzes and hatchets in



Spectacular example of early wood carving is the totem pole



On the Navajo Reservation in Arizona, the Indian's latent ability to work with wood is now finding expression with new tools in the forest

the display cases. If they had been used for felling trees once they could be used again. It was only necessary to attach a new haft to replace the original one which had long since rotted away. Accordingly, a fair specimen of prehistoric Indian flint ax was hafted following the methods which historians say was most common. A prominent anthropologist shouldered the strange tool and went off on a minor forestry expedition to see how it performed.

The results of that trial can be seen in a museum case on the second floor today. Stone axes, far from being crude and ineffectual tools, it was discovered,

compare favorably with a steel ax in the hands of a competent woodsman. A sapling almost four inches through was felled in a few minutes. The same stone ax was used to trim away the branches and prepare the timber for use as a house post or beam. Perhaps the backward Indian shouldn't be pitied at all.

Don't think that the North American natives turned their backs to the implements of civilization when they once became available. On the contrary, trader's records show that the steel knife, the ax, the saw and hammer were among the most popular goods for which a young brave would barter his meat and

peltries. In some cases, however, the new implements found strange uses.

The Eskimos, for example, had never learned to saw. Before the coming of the traders they had used a crude thong drill to bore a row of close spaced holes along the line on which they wished to cut a plank. When saws became available, did they use them? Not on your life. Instead, they traded sealskins and walrus ivory for a cheap ratchet drill with steel drill bits. With this new tool of the white man a painstaking task was speeded up, but the method didn't depart too violently from the tradition which was so familiar. Primitive people are like that. They resist changes to the very last ditch.

The Algonquian tribes of Maine and Quebec used barrel hoops and other bits of iron or steel discarded by the white man to fashion the famous crooked knife. Give a Montagnais Indian an ax and a crooked knife and in an hour or so he'll make a birchbark canoe good enough to cross a river. Let him spend a week or two in the building, sewing patches in the bark to cover weak spots, caulking seams with pine rosin, adding a strut here and there to insure symmetry, and he'll turn out a craft that's as sleek as a factory built model—and a good deal stronger.

Even before the advent of metals American natives had hand tools. The so-called "thumbnail scraper" of the Plains tribes was in effect an entire miniature tool kit in itself. Used alone or hafted in a split twig, it could incise a groove which was deepened by continued strokes; it could "carve" down superfluous material, shape, finish, or decorate a wide variety of wooden objects. The scrapers, about the size of a gunflint, were resharpened by chipping back the edge after the original had become worn smooth. The small scraping tool, plus a good stock of patience, was used in excavating small dishes and boxes, spoons, cups, and ceremonial masks and figures. The use of curly knots for dishes was widespread since a large part of the hollowing process had already been accomplished by nature.

Least original was the Indian in his methods of securing firewood. The standing deadwood of convenient diameter was simply broken off and hauled into camp. Contrary to the typical picture of a neatly arranged Indian campfire, the cooking hearth was likely to be a scene of untidiness. Wood was not broken up any more than necessary. Irregular pieces were arranged in rough star fashion, radiating from the fire at their center. As a log or branch was consumed it was pushed up.

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At their own sawmills, Navajos manufacture the lumber which later will be used in constructing Indian houses and community buildings

Editorial

The War and the Parks

Pressure upon the National Park Service to make available resources in the national parks grows ominously more acute. In January, the National Wool Growers' Association at their annual meeting in Salt Lake City passed a resolution urging that the national parks be opened to the grazing of sheep. In February, the Park Service cushioned the growing demand for Sitka spruce and Douglas fir in the Olympic National Park by opening Queets Corridor to the cutting of four million feet of these species. During the past fall and winter the State of Washington sold seventy million feet of spruce from state lands adjoining the western boundary of the park. This timber will be cut to supply airplane stock, for use both in England and the United States.

The Queets Corridor is not in the

Olympic National Park proper. It is a strip of land along the Queets River from the park boundary to the Pacific Ocean. This strip has been in course of acquisition by the government as a parkway drive from the ocean. Its addition to the park proper has been waiting on completion of land purchases. Since the timber in the Corridor is not under the same prohibition against cutting as that in the national park, officials of the Service felt the critical species should be made available as a contribution to the war. Contracts of sale, however, call for selective cutting and the leaving of an uncut strip of forest along the road right-of-way.

Thus the war moves to the very gateways of the national parks and raises the vital question—Have war needs for either meat or timber become so desper-

ately acute as to justify invasion of our national parks? Officials of the Park Service whose responsibility it is to guard and preserve the parks in their entirety are not convinced that they have and say that they will continue to oppose opening the parks proper to either lumbering or grazing.

We think the position is well taken and that it will have the support of the general public. Certainly a clearer showing of war emergency than is now apparent is needed to justify either timber cutting or extensive grazing in the national parks at this time. We are fighting to preserve our country. The national parks are its cathedrals of natural greatness. Let's not start destroying them from within even in part, until it is clear beyond all question of doubt that such a sacrificial course is necessary to turn the tides of war from defeat to victory.

The Ivory-Bills

With spring again on our doorsteps. Mr. Blackford's article on page 102 of this issue is a timely reminder of the intimate relationships existing between forests and many species of American wildlife. One of the most significant to be revealed recently relates to the Ivory-billed woodpecker, a wild woodland bird of the southeastern and lower Mississippi states. The Ivory-bills are thought to be the rarest birds in America today. They are so rare that few persons know them, fewer still have seen them and probably not more than half a dozen men have been fortunate enough to photograph them.

For fifty years the Ivory-bills have been on the way to extinction. The best information today indicates that there are only about twenty-five of them left in the country. At one time—in the 1920's—they were given up as gone. Then in 1932 a few individuals were reported as having been seen in Louisiana, Arthur A. Allen, professor of ornithology at Cornell University, sought them out, located a number of birds and succeeded in photographing them and in recording their voices.

This was the high point in "rediscovery" of the Ivory-bills. It inspired ornithologists and bird lovers with a hope that the bird might still be saved. But they were at once confronted with a lack of knowledge of the bird's habits and habitats upon which to base an intelligent program of conservation. To meet this lack, the National Audubon Society established a research scholarship at Cornell and E. T. Tanner, a graduate student in ornithology, spent three years, 1939-1941, studying the bird through the length and breadth of its known range. Mr. Tanner did not himself find many Ivory-bills—he estimates the number remaining as twenty-four—but from evidence he gathered from its old haunts, from local people who had known the bird and from direct observation of the few birds he did locate, he was able to compile the most complete history of the Ivory-bill now available. From this data he determined the essential environment it will be necessary to provide if the Ivory-bill is to be saved.

First and last, this environment is the virgin forest. Second growth forests, it appears, will not do. The explanation

is that the Ivory-bill in order to maintain itself must have wood-boring insects that are to be found only in dead and dying trees and that these trees are to be found in sufficient abundance only in old or virgin forests. In support of this finding, Mr. Tanner's record of the bird shows that its disappearance from one region after another in the South has coincided closely with the cutting of the virgin forests.

With this knowledge now available, bird lovers are confronted with the task of acquiring a fairly large area of virgin forest in the South as an Ivory-bill refuge. The best opportunity, according to Mr. Tanner, is in northern Louisiana in an uncut section of virgin timber owned by the Singer Sewing Machine Company. Here Mr. Tanner located a half dozen Ivory-bills. Unfortunately the Singer timber has been contracted and lumbering threatens their wild and remote retreat. With the country now at war, the task of raising funds with which to purchase and set apart this refuge for the perpetuation of the Ivory-bills is a worthy challenge to a bird-loving America.

YOUR SHADE TREES:

CARE IN PLANTING

By L. E. MANNING

SELDOM, if ever, is planting information given from the point of view of the tree. Rules and cautions for tree planters are helpful in getting good results, of course, but much more confidence in one's methods—and, incidentally, more pleasure—can be achieved at the cost of only a few minutes consideration of the tree itself.

A puppy, to use an animal as an example, is readily understood because it must eat, sleep, drink and be taken out-of-doors at regular intervals. But a tree is altogether different. It is a much simpler form of creature. Instead of running after its dinner, puppy fashion, it stays where it is, depending on rain to wash food down through the earth to its roots. To cover more feeding territory, new roots are constantly being formed by the tree.

To move such a living thing from one home to another is almost like moving a factory that must be kept operating during the entire moving period. The leaves use sun-power to form carbohydrates in their chlorophyll cells. These chemicals are used in the building of new cells, not only in the leaf, but in the trunk, branch, or root. To the leaves come raw materials: Carbon drawn from the air, and from the roots, oxygen and water, in which chemical salts, such as salts of nitrogen, potash and phosphorus, are dissolved.

The problem is to move all this without too much interruption. Obviously, the carbon supply which is drawn from the air is not affected; the thing to watch is the root system. The most active part of the root is the mass of tiny almost invisible hairs along the main root branches. These absorb oxygen from the air spaces between earth particles and, from the moist film which covers these same particles, the dissolved chemicals and water.

Since soil particles are barely visible, there must be a very fine contact between rootlet and earth. A gap of even one-eighth of an inch would be an unbridgeable chasm. Such a minute adjustment, once it is broken, can be re-established only by tramping the soil firmly and following up with a small flood of water. This will settle the soil particles snugly around the roots again. A point to emphasize is that there must be good drainage. Unless the water is drained off, leaving the soil settled, a fresh supply of oxygen cannot be sucked down into the soil to fill the space the water occupied. It is only in this manner that Mother Nature is able to keep the subsoil atmosphere fresh.



With the roots properly dug and the top properly pruned to balance, the four essentials of planting are: 1—Tramp soil firmly; 2—further settle the soil with water; 3—provide good drainage; 4—keep roots moist until the planting is done

This periodic flooding of the root system is precisely what happens during every rainstorm. In gravel or very sandy soils the result is that all food (salts) is washed down below root-level, thus eventually starving the plant. Moreover, such loose soils retain only a very thin film of moisture around each coarse particle; and even this dries out quickly so that plants growing in it suffer from drought. Such soils require frequent watering and plenty of fertilizing.

Clay, on the other hand, permits little food to be washed away. Nor does it dry out quickly. Clay soils, therefore, must seldom be watered and require little fertilizing. But something needs to be done about the air supply, for roots require oxygen. It is necessary to provide artificial drainage by laying tiles or building a well of stones before planting. Ordinary soils are neither pure sand nor pure clay, of course.

An ideal soil for most trees contains less clay than sand, and, in addition, a large percentage of decayed organic matter of all kinds. In such soil the clay keeps damp, the sand lets in air, and the organic matter, or humus, provides long-term water storage and, by slow decay, a source of food. Extra drainage, watering, or feeding need not be provided. Determine for yourself whether your soil is noticeably sandy or heavy. Then apply the proper treatment.

While on the subject of water, it may be well to consider the available supply at the desired planting site. For water supply is altogether separate from drainage. Rainfall makes periodic floods, but in many climates rain comes too seldom and falls too heavily to be altogether satisfactory to a tree.

Frequently in such climates, there is a subterranean source—as from higher ground—which permits only slowly the descent of accumulated rainwater to the tree below. Thus the roots obtain a slow daily supply, generally renewed by more rain before it is entirely exhausted. Even if rain be too long delayed, the rootlets are usually able to find food-laden moisture in the thin film which surrounds soil particles many weeks after the last flooding. A surprising amount—often 100 gallons a day—is drawn up from such tiny sources by the root-system of a large tree.

But if all natural means fail, one must resort to artificial wa-

tering. Follow nature's system if you would suit the tree. It is accustomed to a great deal of water and a decent interval before the drink is repeated—perhaps a week, certainly several days.

Safety Precautions

Though you may want to transplant a tree in mid-summer, refrain from doing so unless you expect to fail. There are some things about planting trees that can best be compared to a surgical operation. First, an anaesthetic is needed, and nature provides her own. Trees go into a "dormant" stage every autumn, not to emerge until mid-spring. If planted out of season—or heavily pruned out of season—they can bleed to death or, like humans, die of post-operative shock.

This sets an automatic time rule for deciduous trees: Plant from October through to early May. In the North one cannot usually get into the ground to plant later than December or earlier than March, which divides the season into a fall and a spring period—equally good.

Even in the dormant season, however, too much exposure will destroy the root tissue, which is accustomed to moist earth. Large trees, or those difficult to transplant, are usually dug with a ball of earth which not only keeps roots moist, but preserves close contact between rootlets and earth. But ordinary shade trees under, say, twelve or fourteen feet do not need such treatment, particularly if a nursery-grown, transplanted tree is used. This applies only to deciduous trees, of course, and even then the ordinary kinds. Evergreen trees have a different kind of sap—resinous—which hardens upon exposure to air. Even young ones must either be dug with a ball of earth or kept moistly covered all the time they are out of the ground. Two minutes is about the longest safe exposure—just ample time to place and plant in a hole already prepared. Shade trees are much more tolerant than this, though it is highly advisable to keep them moist also.

Larger trees, those eight feet or over, or those more exposed must be staked or they will topple over. For the root system is not only the producer of raw material but also the foundation and support of the entire structure. Also, many trees in windy locations, particularly if planted in the autumn, may lose enough tissue moisture so that the bark of the trunk becomes dried out. Here a bandage of cloth or a spray of wax is indicated as an obvious precaution. And in any case, even if neither staking nor bandaging be done, and they are commonly omitted with success, the roots should be given extra water, perhaps

twice a week, for the first month or two after transplanting. This not only strengthens the bond of earth to root, but aids in preserving tissue moisture.

A final consideration: The bark on root is very different from the bark on trunk. One is accustomed to constant moist earth, the other cannot endure such dampness. If the tree be planted

too deeply the trunk bark either rots or, if it does finally succeed in transforming itself into root-tissue, delays the growth and recovery of the whole tree. Plant a tree within an inch, one way or another, of the depth it stood before moving. You can see the difference between the bark of trunk and root if you look carefully.

THE QUERY CORNER

QUESTION: How can a frost crack in a tree be prevented?—W. W. B., York, Pennsylvania.

ANSWER: A frost crack cannot be prevented. However, its reoccurrence and subsequent injury frequently may be eliminated by placing bolts through the tree at right angles to the plane of the crack. An old frost crack requires more thorough attention and complete cavity treatment may be required for a valuable shade tree.

QUESTION: When is the best time to plant broadleaved trees?—A. G. H., Toledo, Ohio.

ANSWER: The two normal seasons for planting broadleaved trees are spring and fall. It is safe to say, however, that all trees except evergreens may be planted at any time during their dormant period when the soil is capable of being worked—that is, when it is not frozen. This begins with the dropping of the foliage in the autumn and ends when the spring buds burst forth. Evergreens are usually most successfully planted in late spring or during August and September.

QUESTION: What shade trees are most susceptible to leaf scorch?—B. H. K., Richmond, Virginia.

ANSWER: Leaf scorch is most prevalent on Norway, sugar, silver and sycamore maples, and on Japanese red maple. It also occurs on horse chestnut, tulip and beech, and to a lesser extent on oaks and other deciduous trees.

The first symptoms of leaf scorch, usually appearing in June, are light or dark brown areas between the veins or along the margins. The edges of the discolored areas are very irregular, and all the leaves on a given branch appear to be affected more or less uniformly. When a considerable area of the leaf surface is discolored, the canopy of the tree assumes a dry, scorched appearance. In extremely severe cases, the leaves dry up completely, then fall prematurely. When such defoliation occurs before

midsummer, new leaves are formed before fall. In mild cases, the leaves remain on the tree, and little damage results.

Leaves are scorched when the roots fail to supply sufficient water to compensate for that loss at critical periods. They are most severely affected during periods of high temperatures and drying winds.

QUESTION: What is the best treatment for root freezing?—B. K. B., Washington, D. C.

ANSWER: Treatment for root freezing includes cutting off the injured roots and dressing the cut ends to prevent infection; fertilization to stimulate growth; and mulching to conserve soil moisture.

QUESTION: When should box hedges be trimmed?—and how often?—M. V. G., Riverdale, Maryland.

ANSWER: Box hedges can be trimmed best in early May when the growth first starts. Hedges should be sheared lightly. The work can be repeated in August, but early spring is the best time.

QUESTION: What evergreens native to Missouri can be used for ornamental or windbreak plantings?—L. E. M., Missouri.

ANSWER: Red cedar grows well even on poor soil, and at maturity produces wood valuable for many purposes. Extensive planting in orchard sections should be avoided because it is a host for cedar apple rust.

Shortleaf pine occurs naturally in the Ozark section, is rapid growing and attractive. It is a large tree at maturity and suitable for ornamental and shade purposes.

Errata:

In the January issue in the table of tree habits the CEDRELA should be noted as "root-greedy." It will not destroy water-pipes, but will heave up sidewalks—so is a poor street tree.

Tree Trails . . .

Across America in Search of the Rare and Unusual

IN HAPPIER days of peace, spring in the City of Washington attracted thousands of visitors seeking the beauty of its trees. For the Capital City, now the busy, throbbing nerve center of a nation at war, is a veritable treasureland of trees, boasting nearly two thousand varieties, including shrubs, of two hundred distinct species. It holds, with the exception of a few arboretums, more different kinds of trees and shrubs than any city on earth.

This tree wealth of Washington does not stop at the city's boundaries. It blankets westward to the Blue Ridge Mountains in Virginia, eastward over the rolling hills of Maryland, and southward through the tidewater regions of

both states. Indeed, few states are richer in trees and tree lore than Virginia and Maryland. Virginia, for instance, lays claim to the largest American holly in the world, and its great arborvitae, perhaps better known as eastern or northern white cedar, at Natural Bridge is king of its race. This majestic tree, with a circumference four and a half feet above the ground of fifteen feet, six inches, is probably the oldest tree in the East, with the exception of ancient cypresses of Florida. It is 125 feet tall and has a limb spread of fifty feet. It was reported to The American Forestry Association by F. C. Pederson, state forester of Virginia.

Maryland is noted for its ancient

oaks. In its fertile soil today stands the largest known white oak, the largest chestnut oak, the largest scarlet oak, and the largest southern red oak. In Maryland soil, too, stands the largest hickory, a mockernut, and the largest black walnut. But no tree in Maryland is so cherished as the great Liberty Tree at Annapolis, an ancient tuliptree. This grizzled giant, according to measurements made by F. W. Besley, former state forester, has a limb spread of 117 feet, is seventy-nine feet tall, and has a trunk circumference four and a half feet above the ground of twenty-six feet. It is the largest known tuliptree in the world.

And it is steeped in history. Standing on the campus of famous St. John's College, founded as the King William's School in 1694, it is estimated to be nearly six hundred years old. According to a tradition, a treaty with the Susquehannock Indians was made under the tree in 1652. In its shade, the citizens of Annapolis gathered frequently in colonial times. And in 1824, Lafayette was entertained beneath its branches. At one time the life of the tuliptree was seriously threatened by decay in a large hollow in its trunk. But the decay was arrested in a rather unusual manner. A number of boys, in search of fun, exploded two pounds of powder in the dry rotting hollow of the tree. The explosion, instead of injuring the tree, saved it by burning out its decaying portions.

Maryland, also, was the scene of discovery several years ago of what has been referred to as a "Spanish walnut." It all came about when the Hillculture Division of the Soil Conservation Service, engaged in exploratory studies to find and develop superior erosion-resisting plants of economic value for planting in soil conserving land-use programs, came upon a walnut tree which appeared to be a hybrid between the common black walnut and the Persian (English) walnut. These hybrid trees, according to C. S. Britt, of the Soil Conservation Service, are extremely interesting in that they are the survivors in areas where pure Persian walnut trees succumbed long ago.

This particular tree has a handsome rounded head which shades a circle



Virginia's great arborvitae, one of the oldest trees in the East

eighty feet in diameter. The pinnate leaves have from nine to thirteen leaflets, in this respect resembling the Persian walnut, which has from five to nine, rarely to thirteen leaflets. The black walnut has from fifteen to twenty-three. The dark green foliage is very dense and the tree throughout is sound, with every indication of vigorous health. The base of the trunk at four and a half feet above the ground is three feet, five inches in diameter. The measured height is seventy feet. The bark is thick, deeply and irregularly grooved.

In keeping with most hybrids of this form, the tree is a shy bearer. The fruits are smooth, light green, slightly oblong, and from one and a half to two inches in diameter, with the husk constituting about one-third. The shell is comparatively smooth to the hand, although deeply and irregularly fissured. It is somewhat four-lobed and depressed at the base. In cracking, the shell is thick, hard and bony.

The tree is located on the estate of Eldridge Downs at Ingleside, Queen Ann's County, by whom it is referred to as a "Spanish Walnut." The exact age of the tree and its origin are unknown. The estate, originally called "Rachel's Desire," has been in the Downs family since Maryland was first settled. It was bequeathed by John Downs, the first owner, to his son in 1798, and it is believed that the house was built between 1750 and that year. An addition was made to the house in 1856 and the tree was apparently planted prior to that time. According to the present owner, it was a large tree when he acquired the place in 1873.

Although California is a long step from Maryland, and March is hardly the month to talk about Christmas trees, here is a tree story that must be told. It is about a single white fir and a baker's dozen of Christmas trees.

As the result of an accident, this fir, growing on the Stanislaus National Forest in California, this season yielded a harvest of three Christmas trees four feet high and all perfectly formed. The same tree, in thrifty condition, has at least twelve more Christmas trees, two feet high, to be cut at some future Yuletide. It was discovered by forest supervisor J. R. Hall and associate forester F. M. Sweeley while they were supervising the cutting of holiday trees for the armed services stationed in the San Francisco Bay region.

The accident which caused this unusual production occurred some years ago, the foresters report, when a dead tree fell against the fir, pushing the trunk parallel to the ground where it remains today. At the time of the accident forest officers assume the soil was moist because little damage was suffered



Largest tuliptree is this historic giant at Annapolis, Maryland

either by the trunk or by the roots, which continue to function. It is not a large tree, measuring eighteen inches in diameter at the ground and about thirty-five feet in length.

In spite of its prone position and terrific handicap, the fir put to work the growing habits peculiar to the species. Knocked down and deprived of a tall top in the sunlight, it sent out numerous shoots all along the upper side of the trunk. Each shoot was in fierce competition with its neighbor to become the one and only tall, straight new fir of the future. The forest officers state that when the three largest shoots were cut for Christmas trees, the struggling fir was benefitted in exactly the same manner as pruning and thinning, if properly done, help other species of trees. A pine cannot do this, foresters point out, but a fir can and does. In this process this tree will produce fifteen or more Christmas trees and, with luck and careful pruning, may send a tall shoot into the

sunlight to form a tree, not as fine as the original, but a reasonably good facsimile thereof.

Following publication in the February issue of a report on American big trees, a number of letters coming to this department took issue with the statement that the giant white oak at Wye Mills, Maryland, was the largest of its species, claiming the honor for the famous Mingo oak of West Virginia.

According to R. O. Bowen, state forester of West Virginia, the great oak of Mingo County died in 1938. It was cut down with ceremony before a gathering of 1,500 citizens.

This giant measured twenty-three feet, six inches in circumference, whereas the Maryland tree has a circumference of twenty-seven feet, eight inches. Its limb spread was 130 feet, that of the Wye Mills oak 165. Only in its height of 145 feet did the Mingo tree excel. The Maryland oak, recently purchased by the State, is but ninety-five feet tall.

NOBLE FIR

Abies nobilis, Lindley

By G. H. COLLINGWOOD



AS ITS name suggests, this tree is an aristocrat among the true firs. In its native forest environment and growing at its best, it is a magnificent specimen, lifting its crown on a clean and symmetrical trunk a hundred and fifty to two hundred feet into the sky. On rare occasions, its topmost leader will touch the two hundred and fifty foot mark and its trunk girth at the base will exceed twenty feet.

In its crown too there is character that helps to distinguish it from other firs within its range. Standing out rigidly and somewhat sparsely, its branches grow at right angles to the trunk in widely spaced whorls or groups to form a round-topped cone, which at distant view often marks its identity. In the dense mature forest, its straight and symmetrical trunk is often clear of branches for a hundred feet. Open grown, however, branches may clothe its stem to the ground, the lower ones tending to droop.

Locally, noble fir is also known as feather-cone red fir, bracted red fir, larch and Tuck-Tuck, the last an Indian given name. Lumbermen have given it the name "larch" for marketing reasons. Wood of noble fir is superior to that of the other true firs and to offset the market prejudice against the latter, the trade name of larch has been used, although the tree has no relation to the larches.

Noble fir grows from the slopes of Mt. Baker in northern Washington southward along the Cascade Mountains to southern Oregon, in the Siskiyou Mountains of California, and in the coast mountains of Washington, with the chief commercial range located in the central part of the Cascades in southern Washington and northern Oregon.

While demanding an abundance of soil moisture, the tree grows on many kinds of soil, but reaches its best development on deep, rich soil. It occurs on gently sloping ridges, valleys, and plateaus at elevations from 1,400 to 6,000 feet above sea level through a zone of uniformly mild, damp climate.

Growth of noble fir is fairly rapid, offering equal competition with its associates, which are usually Douglas fir, western white pine, western hemlock, and less frequently mountain hemlock, lodgepole pine, and silver and alpine firs. Pure stands of noble fir are rare and small in area. Little is known about the age of this species, but probably it is the longest lived of the firs.

The bark of noble fir is thin, averaging one or two inches thick on older trees. Grayish brown in color, it is broken by narrow grooves into irregular, soft plates covered with closely pressed scales that flake off, revealing a ruddy-

The trunk of Noble Fir is straight and symmetrical, while the sparse, short branches arranged in whorls, form a round-topped conical crown

colored underbark. On young trees the bark is gray and has the resin blisters common to the bark of young trees of other firs. The rounded reddish winter buds are about an eighth of an inch long, coated with resin, and the twigs are slender, hairy and reddish brown.

The curved needles of noble fir vary in color from pale to dark blue-green and appear to grow in a crowded mass along the upper sides of the branches. Needles of the lower branches usually are notched at the tip, and are about one or one and a half inches long, while those of the upper branches, noticeably four-angled, are about five-eighths to three-quarters of an inch long, and nearly always sharply pointed. All needles are grooved on their upper surface. In the vicinity of Davis Lake, Oregon, where the ranges of noble fir and red fir overlap, this groove characteristic offers a means of distinguishing the two species. Needles of red fir, instead of being grooved, are ridged on the top.

Flowers are borne on twigs of the previous season. The purple staminate or pollen-bearing ones hang singly from the branches of the lower crown, while the reddish or yellowish green ovulate ones with broad rounded scales and long bracts stand erect and scattered on the topmost branches. The erect, oblong, round-tipped cones are four or five inches long and are strikingly different from the cones of other firs, in that they have sharply pointed bracts which entirely cover the scales and give them a shingled appearance. Ripening early in September, the cones start to drop their scales and liberate the seeds in October.

Pale reddish brown, the seeds measure about a half inch in length, and are blunt and slightly rounded at the tip. The species is a fairly prolific seeder, some seed being produced every year, with abundant crops occurring at irregular intervals. Trees up to sixty years of age produce seed, but the largest crops are produced by older trees. The rate of germination is low, and seeds do not long retain their vitality. Seedlings grow best on mineral soil and humus in the open or in partial shade, but will not develop in continuous shade. Forest clearings or burned areas soon support an abundant growth of seedlings when parent trees are present.

A cubic foot of noble fir wood when dry weighs twenty-eight pounds. It is hard, strong, very close-grained, firm, and in color is light brown marked with reddish brown streaks which add to its beauty. Sapwood is darker than the heartwood. It is low in fuel value, but works easily and takes a good polish. Its uses include flooring, interior finish, doors, window sash, boats, crates, and boxes.

The thin bark makes the tree subject to injury by fire, but as it usually grows in moist locations, this danger is lessened. There is some loss in old trees due to fungus decay, but little in younger ones, while attack by insects is almost unknown.

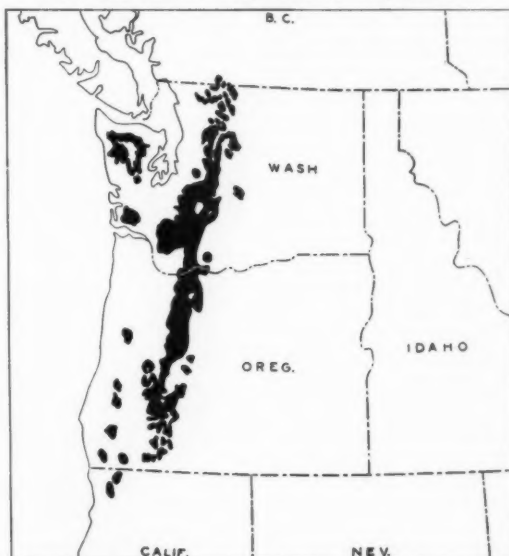
In Europe noble fir has been successfully planted as an ornamental tree. In eastern United States, it will survive the winter cold as far north as central New England, but has not proven as satisfactory for ornamental purposes as some of the other firs.



The erect, oblong cones have sharply pointed bracts covering the scales like shingles



The thin grayish brown bark is broken by narrow grooves into irregular, soft, scaly plates



Natural range of Noble Fir

You Can't Win With Fire

(From page 108)

of experienced fire fighters available to train and direct these recruits is rapidly diminishing.

A move to request the Selective Service to defer for the critical fire months up to 5,000 eighteen and nineteen-year-old boys for fire line duty was unsuccessful. Youngsters of this age group were of material help in 1942.

A concrete idea of the appalling manpower situation may be gained from the Pacific Coast region where a joint fire protection plan was recently mapped out by federal, state, and private agencies. On the basis of 1942 experience, these agencies set minimum manpower requirements for the coming season at 17,000 men, women, and boys. Of this number, it was estimated that 13,500—about 3,000 with fire experience—would be available in the region. The remaining 3,500—probably high school boys, must be recruited from east of the Mississippi River.

These youngsters, if they can be recruited along with local boys, will be given intensive training for thirty days before assignment to duty in the forest. The second line of defense will be held by women and older men—as fire look-outs, dispatchers, radio operators, tool checkers, drivers, and cooks. In fact, it is planned to utilize women in every job for which they are qualified, reserving as many able-bodied men as possible for fire-fighting duty.

Conscientious objectors will be utilized in the critical areas, and a number of training camps already have been established. From the ranks of these men will be developed fire-fighting parachute jumpers essential to the speedy control of blazes in rugged, remote country.

Many already have volunteered for this service. Prison labor will also figure in the 1943 fire protection picture, and the Immigration Service has been asked to approve for use on the fire line several hundred interned Italian merchant seamen.

The Forest Fire Fighters Service—better known as the Triple-FS—is in the stage of development. Created last summer by the Office of Civilian Defense, these volunteer groups, the forest equivalent to the familiar city air raid warden service, are being rapidly organized and trained under federal and state supervision. Except in the South and East, for the present at least, the Triple-FS will function as a second line of defense.

The equipment situation is not likely to prove as serious as that of manpower. Transportation is the number one problem here with scarcities in automotive and water equipment, especially tank trucks and pumpers. An innovation this summer will be the use of bicycles where the terrain permits. No shortage is anticipated in aircraft for the transportation of men and supplies. Hand tools, such as rakes, shovels and mattocks, are believed to be generally sufficient. Radio equipment has been hard hit, with little relief in sight. On the whole, the equipment situation could be a lot worse—and undoubtedly will be in 1944.

This, briefly, is the over-all picture of the forest fire scene as the nation enters its second year of war. It is not good; but neither is it hopeless. If the manpower situation is critical, as certainly it is, the country can be thankful for the cool heads and experienced hands of a small band of veterans who remain to direct the job. They represent both

the public and the forest industries; and they are organizing now with limited means to face what can become the most tragic of all forest fire years.

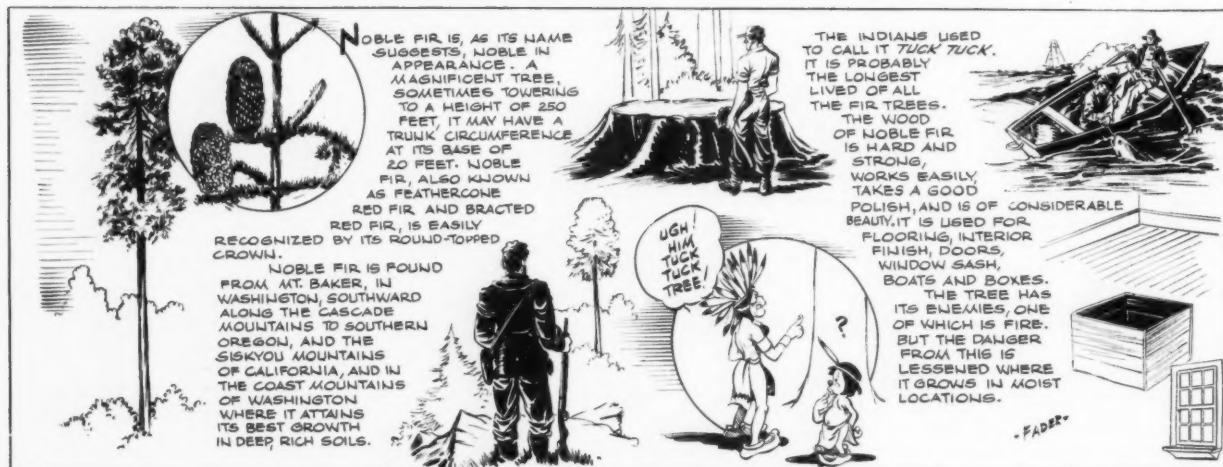
For the danger from sabotage has not disappeared. Nor has the possibility of aerial fire bombing by enemy action. These threats, as well as that of a bad lightning year, are not ignored by officials responsible for forest protection. Nor must citizens ignore them. By eliminating even a fraction of the 180,000 fires caused by carelessness, the manpower available can more effectively be deployed to meet such emergencies.

The Congress of the United States must consider this peril also, since it holds the purse strings on public funds. Recent estimates indicate that the cost of defending the major fire zones may exceed \$10,000,000, or \$2,000,000 more than was provided in 1942. This increase, if granted, will little more than balance rising costs of operations, however, since they are up from fifteen to twenty per cent over last year. Any false economies or delays in providing for forest fire protection may therefore prove disastrous.

Indeed, legislators and their constituents alike would do well to weigh carefully the words of fire protection leaders throughout the country. The words, for example, of T. S. Goodyear, supervisor of forestry for the important timber and war industry state of Washington. "It is daily becoming more difficult for forest protective agencies to compete with wages paid by the war industries," he states, "and the problem is to hold even a skeleton fire organization, including

(Turn to page 140)

TREES AND THEIR USES—No. 73—NOBLE FIR



CONSERVATION IN CONGRESS

BEFORE ending by *sine die* adjournment on December 16, 1942, the Seventy-seventh Congress enacted 850 public laws from 3,094 bills and joint resolutions introduced in the Senate and 3,060 in the House. Number of days of service totaled 711, longest in the history of Congress.

Outside of public laws appropriating funds for forestry and conservation activities of the federal government, only one public law, No. 844, was enacted which can be considered of major importance to forestry and conservation. Introduced by Representative Fulmer of South Carolina, Public Law 844 expands the definition of "war materials" used in the Sabotage Act of 1918 to include forest products and standing timber suitable therefor. In effect, this makes forest incendiarism and timber theft a federal offense for the duration of the war and six months, punishable by \$10,000 fine or up to thirty years' imprisonment, or both.

Convening on January 6, the Seventy-eighth Congress heard the President's annual message and received the Budget. Forestry and conservation items in the Budget, summarized in the February issue, will come before House Appropriation subcommittees in the next few weeks. Hearings on the Agricultural Department appropriation bill began the week of February 15, before the Agriculture Appropriation Subcommittee consisting of Representatives Tarver of Georgia, chairman, Cannon of Missouri, Sheppard of California, Wene of New Jersey, Lambertson of Kansas, Dirksen of Illinois, and Plumley of Vermont.

Tendency of this Congress to cut "non-war" appropriations "to the bone" is indicated by the elimination of the \$1,400,000 National Resources Planning Board item by the House Appropriations Committee in reporting the Independent Offices Appropriation Bill, H. R. 1762, on February 9. If agreed to by the House and Senate, the Board will be without funds to operate.

New Forestry Bills

In the first month of Congress nearly 2,000 bills have been introduced in the House and over 500 in the Senate. Among the most important forestry and conservation bills introduced are S. 45, by Senator McNary of Oregon, on January 7, providing a \$9,000,000 authorization for cooperative forest fire protection under the Clarke-McNary law; S. 49 and S. 250, introduced by Senator

McNary, and H. R. 1621, by Representative Stockman of Oregon, which authorize cooperative sustained-yield agreements embracing public and private land, including sale of national forest stumpage at a fair market value without competitive bidding.

Representative Fulmer, of South Carolina, again introduced his lease agreements bill, which authorizes cooperative management of farm woodlands, as H. R. 2. Significant is House Resolution 92, introduced by Representative Fred Norman of Washington, on February 2, which would create a twenty-one-man House Forestry Committee to handle forestry matters now referred to the House Agricultural Committee under the chairmanship of Representative Fulmer.

O and C Lands

Introduced by Senator McNary on January 11, and by Representative Ellsworth of Oregon, on February 4, companion bills, S. 275 and H. R. 1688, would include under the O and C administration all unpatented lands in the odd-numbered sections included within the indemnity limits of certain grants made to railroads in 1866, except such lands as have heretofore been transferred. Providing for a forest credit bank in the Farm Credit Administration to make available further credit facilities to forest landowners, S. 47 was introduced on January 7 by Senator McNary.

Stream pollution legislation introduced by Representative Weiss of Pennsylvania, on January 25, as House Joint Resolution 68, would prohibit government agencies from purchasing pulp and paper manufactured by any company permitting the pollution of streams. Introduced by Congresswoman Smith of Maine, on January 6, H. R. 98 would create a division of water pollution control in the United States Public Health Service for regulation of stream pollution. Congressman Lea, of California, introduced H. R. 504 on January 6, authorizing a survey of San Rafael Creek, California, for flood control, run-off, water-flow retardation and soil-erosion prevention.

"Lifting" of the \$250,000 limit for the Forest Survey is provided for in companion bills, S. 44 and H. R. 1456, by Senator McNary and Representative Randolph of West Virginia. Introduced by Senator McCarran of Nevada, on January 7, S. 31 would prohibit any change in grazing fees under the Taylor

Grazing Act without consent of the district advisory boards.

The Seventy-eighth Congress has so far produced several bills providing for payments to local governments in lieu of taxes on federally owned or acquired lands. One bill, S. 438, introduced by Senator Langer of North Dakota, on January 18, would permit state and county taxation on all lands owned or acquired by the United States.

Authorization of \$445,000 for purchase of additional lands for the Deschutes National Forest, Oregon, is contained in companion bills, S. 48 and H. R. 1306, introduced by Senator McNary and Representative Stockman of Oregon. Senator McNary also introduced S. 247, which would enlarge the Willamette National Forest. Authorization to acquire forest lands adjacent to highways, roads, or trails constructed with federal funds was introduced by Representative Angell of Oregon, as H. R. 487.

Great Smoky Mountains Park

Introduced by Senator McKellar of Tennessee, on January 21, S. 551 would accept cession by the states of North Carolina and Tennessee of exclusive jurisdiction of the lands embraced within the Great Smoky Mountains National Park. Provision for the establishment of the Tensas Swamp National Park, Louisiana, is contained in Senator Ellender's new bill, S. 468, introduced on January 21. Representative Fred Norman, of Washington, introduced H. R. 1654 on February 2, authorizing \$35,000 for the purchase of equipment of the Olympic Chalet Company in the Olympic National Park, for joint use by the National Park Service and the United States Army.

On January 7, Congressman Robinson, of Utah, introduced H. R. 837, which would add certain public lands to the Uintah and Ouray Reservation, Utah. Representative Robinson also introduced H. R. 838, which would make all grant lands released by the railroads under the Transportation Act of 1940, part of the public domain.

Continuation of the Special Committee to Investigate Conservation of Wildlife is provided for in House Resolution 20, introduced by Representative Robertson of Virginia on January 6. Representative Stockman introduced H. R. 1303, on January 19, providing for a code of regulations to conserve fish and wildlife on Indian lands.

CONSERVATION CALENDAR

Important Bills in Congress With Action
January 6—February 6, 1943

Resolutions Enacted

S. Res. 39—McCarran—Continuing the authority conferred by Senate Resolution 241, 76th Congress, relating to the investigation of the use of public lands and the filming of motion pictures thereon. Introduced January 11, 1943. Agreed January 28, 1943.

S. Res. 73—O'Mahoney—Continuing S. Res. 53, 77th Congress, relating to the investigation with respect to the development of the mineral resources, including oil and gas, of the public lands of the United States. Introduced January 18, 1943. Agreed January 28, 1943.

H. Res. 20—Robertson—To continue the Special Committee to Investigate All Matters Pertaining to the Replacement and Conservation of Wildlife. Introduced January 6, 1943. Agreed January 21, 1943.

Forestry

S. 45—McNary—To further amend Section 3 of Public Law No. 270, (Clarke-McNary), approved June 7, 1924, providing for forest perpetuation and extension by increasing the annual authorization therefor and extending aid in combating tree insects and diseases. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

S. 49—McNary (S. 250—McNary) (H. R. 1621—Stockman)—To promote sustained-yield forest management. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

H. R. 2—Fulmer—To authorize the Secretary of Agriculture to enter into lease agreements with farmers in order to provide for the management of their forest lands and the marketing of their forest products in accordance with proper forestry and marketing practices. Introduced January 6, 1943. Referred to the Committee on Agriculture.

Governmental Functions

S. 47—McNary—To provide for a Forest Credit Commissioner and for a Forest Credit Bank, within the Farm Credit Administration, to extend credit for furthering the conservation and operation of forest lands, etc. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

H. Res. 92—Norman—Amending the

Rules of the House of Representatives so as to create a Committee on Forestry. Introduced February 2, 1943. Referred to the Committee on Rules.

H. R. 703—Andresen—To expedite the prosecution of the war by making provisions for an increased supply of rubber manufactured from alcohol produced from agricultural or forest products. Introduced January 6, 1943. Referred to the Committee on Agriculture.

Grazing

S. 31—McCarran—To amend the Taylor Grazing Act for the purpose of providing for greater participation by district advisory boards in administration of the act. Introduced January 7, 1943. Referred to the Committee on Public Lands and Surveys.

Lands

H. R. 487—Angell—To authorize the acquisition of forest lands adjacent to and over which highways, roads, or trails are constructed, or to be constructed, wholly or partially with federal funds, in order to preserve or restore their natural beauty. Introduced January 6, 1943. Referred to the Committee on Agriculture.

National Forests

S. 11—McCarran—To provide for the use of 10 per cent of the receipts from national forests for the making of range improvements within such forests. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

S. 48—McNary (H. R. 1306—Stockman)—To provide for the acquisition of certain lands for and the addition thereof to the Deschutes National Forest. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

S. 247—McNary—To enlarge the Willamette National Forest. Introduced January 11, 1943. Referred to the Committee on Agriculture and Forestry.

National Historical Park

H. R. 1184—Randolph—To provide for the creation of the Harpers Ferry National Historical Park in the States of West Virginia, Maryland and Vir-

ginia. Introduced January 14, 1943. Referred to the Committee on the Public Lands.

National Monument

S. 37—Truman (H. R. 647—Short)—To provide for the establishment of the George Washington Carver National Monument. Introduced January 7, 1943. Referred to the Committee on Public Lands and Surveys.

H. R. 1397—Englebright—To authorize the exchange of certain patented lands in the Death Valley National Monument for government lands in the monument. Introduced January 21, 1943. Referred to the Committee on the Public Lands.

National Parks

S. 380—Hayden—To authorize the participation of states in certain revenues from national parks, national monuments and other areas under the administrative jurisdiction of the National Park Service. Introduced January 14, 1943. Referred to the Committee on Public Lands and Surveys.

S. 468—Ellender—To provide for the establishment of the Tensas Swamp National Park, Louisiana. Introduced January 21, 1943. Referred to the Committee on Public Lands and Surveys.

S. 551—McKellar—To accept the cession by the States of North Carolina and Tennessee of exclusive jurisdiction over the lands embraced within the Great Smoky Mountains National Park. Introduced January 21, 1943. Referred to the Committee on Post Offices and Post Roads.

H. R. 1388—Jennings—To authorize the acceptance of donations of land for the construction of a scenic parkway to provide an appropriate view of the Great Smoky Mountains National Park from the Tennessee side of the park. Introduced January 21, 1943. Referred to the Committee on the Public Lands.

Payments to States

S. 32—McCarran—To provide a method of making payments to the several states with respect to certain lands and certain projects of the United States. Introduced January 7, 1943. Referred to the Committee on Public Lands and Surveys.

S. 73—McNary—To provide for a uniform method of payments to the several states on account of certain lands of the United States. Introduced January 7, 1943. Referred to the Committee on Public Lands and Surveys.

S. 248—McNary—Authorizing appropriations for payments to counties in

(Turn to page 137)



THUNDER OVER AFRICA

There's a roar of mighty motors in the African skies. Big transport planes wing above the steaming coastal jungles—the trackless forests of the Niger—the mountains and the desert—speeding war supplies to the Middle East.

Tough young Americans carved the airfields for that vital route out of the heart of the Dark Continent. Sixty days after the job was tackled, Pan American Airways, in co-operation with the U. S. Army Air Transport Command, had a steady stream of traffic thundering across Africa.

It looked like a hopeless task when black men started hacking out the first clearings, carrying earth in baskets on their heads. But the engineers knew

what "Caterpillar" Diesel Tractors could do. Once those powerful machines with their bulldozers reached the new airport sites, things happened fast. Each "Caterpillar" Diesel cleared as much ground in *one hour* as a hundred natives could have cleared in an *entire day*!

Many of these mobile power-plants-of-all-work are still there, helping to maintain trans-African fields. Tough and dependable, they stand up under punishment. And their "Caterpillar" Diesel fuel systems conserve precious oil and gasoline, running economically on any fuel that's available.

"Caterpillar" Diesel Tractors, Graders, Engines and Electric Sets go directly to the fighting fronts all over the

world. In this war, they are saving men and time—building roads and airports, digging tank traps, towing planes, hauling guns, powering winches and air compressors, generating current for searchlights and communications, and supplying main or stand-by power for naval craft.

Meanwhile, the thousands of older "Caterpillar" Diesels are hard at work on the home fronts—in essential construction, mining, lumbering, oil-field, industrial, municipal and farm tasks.

And they're doing a magnificent job, for "Caterpillar" service dealers everywhere have the complete repair facilities and the practical know-how that *keep them working*.



CATERPILLAR DIESEL

REG. U.S. PAT. OFF.
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

TO WIN THE WAR: WORK—FIGHT—BUY WAR SAVINGS BONDS!

HOW TO TAKE CARE OF YOUR GUNS AND AMMUNITION

Since factory stocks of sporting guns and ammunition are exhausted, "make it last" is a more important habit today than ever before. So we're offering some advice you may find helpful.

GUNS . . . if you're using Remington ammunition with Kleanbore* non-corrosive priming, just wipe the gun off with an oily rag occasionally to prevent rust, and put a drop or two of oil in the action.

Of course, if the gun has been out in damp salt air, or if it's gotten soaked, the barrel and action should be thoroughly cleaned, then lightly oiled.

When you store a gun for any length of time, put it in a dry place away from excessive heat. It's a good idea to inspect it from time to time for signs of rust.



And remember, if you have any questions about care of guns, or repairs, call on your local gun dealer. He'll either know the answers or know where to find them.



AMMUNITION . . . the one important thing to do is to store ammunition in a cool, dry place.

And that's a good thing to remember these days!

Remington Arms Co., Inc., Bridgeport, Conn.

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Commission Reports on National Forests

MORE than 33,000 real estate transactions involving federal purchase of 18,000,000 acres of land have gone into the development of the nation's public forests over a period of thirty-one years, according to the 1942 annual report of the National Forest Reservation Commission.

The Commission reported approval of land purchases totaling 243,522 acres at a total cost of \$1,102,790 during the last fiscal year. Lands actually purchased during the year, partly under purchase agreements approved in preceding years, amounted to 342,499 acres at a cost of \$1,383,153.

The need to devote to war purposes all available men, money, and material resources has caused a sharp curtailment of the program of federal land acquisition for public forest purposes, according to the report. Since Pearl Harbor, activities of the Commission have been confined mainly to the consummation of earlier commitments.

In reviewing the results of the Com-

mission's activities during the thirty-one years of its existence, the report concludes: "The present war with its urgent requirements of large acres for military training and large quantities of timber products has demonstrated the public value of extensive federal ownership and management of forest lands. The service and utility of the national forests acquired under the Weeks Law may be even more strikingly demonstrated by the requirements of the post-war period."

The National Forest Reservation Commission was established by the Weeks Law of 1911 to consider and approve lands recommended for purchase under the Act. Present members are Secretary of War Henry L. Stimson, president; Secretary of the Interior Harold L. Ickes; Secretary of Agriculture Claude R. Wickard; Senators Walter F. George, of Georgia, and Styles Bridges, of New Hampshire; Representatives Roy O. Woodruff, of Michigan, and William M. Colmer, of Mississippi.

First Spruce Raft Arrives from Alaska

THE first huge raft of airplane spruce logs from Alaska has reached the mill at Anacortes, Washington, the United States Forest Service reported late in January. Its 900-mile journey from Edna Bay, in southeastern Alaska, was repeatedly interrupted by gales during which it was anchored in sheltered coves.

The raft contains 912,810 board feet of logs, of which 49,300 board feet are hemlock for experimental purposes. The spruce logs averaged 1,967 board feet, which is about the scale of a log thirty-four feet long and a full three feet top diameter. These logs—thirty-eight per cent of No. 1 grade—bettered the earlier estimates of high quality of the Sitka spruce available in southeastern Alaska.

The wartime project for logging high grade spruce from the Tongass National Forest in Alaska was launched to help meet urgent needs for aircraft lumber. Production from Oregon and Washington forests has not been sufficient to supply expanding war requirements in this country and abroad.

The project was initiated last June when Secretary of Agriculture Wickard approved an agreement between the Commodity Credit Corporation and the Forest Service under which the latter, as the Corporation's agent, was to conduct the Alaska airplane spruce production program. Prior to the agreement, the Forest Service—at the request of the


War Production Board—studied the possibilities of utilizing Alaska spruce, following which the WPB approved the plan to supplement the deficient supply of high grade spruce in the Puget Sound area by logging in Alaska.

Under terms of the agreement, logging of Alaskan Sitka spruce is contracted to independent logging companies. The Forest Service also contracts for towing the logs to Puget Sound where they will be made available to mills specializing in cutting spruce airplane stock, or these mills will buy the logs in Alaska with the purchaser assuming risks of towing.

The project presents numerous difficulties, especially in getting men and equipment to the logging sites in Alaska and in rafting logs 900 miles to mills in the Seattle area. Grounding of a barge during a heavy December snowstorm caused a discouraging delay, through loss of some equipment which can be replaced only with difficulty.

In spite of labor and equipment shortages, the Forest Service says that production should be in full swing in the early spring; and transportation difficulties will be less serious after the season of winter storms is over.

Sitka spruce grows to much larger size than any other spruce. This makes it possible to obtain clear, straight-grained lumber suitable for aircraft use from carefully selected logs.



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TREES OF THE EASTERN UNITED STATES AND CANADA, by W. M. Harlow. Published by Whittlesey House, McGraw-Hill Book Company, Inc., New York City. 288 pages, illustrated. Price, \$2.75.

Combined under one cover, Dr. Harlow, assistant professor of Wood Technology of New York State College of Forestry, presents an excellently prepared volume on the identifying features of important eastern United States and Canadian trees and their woodcraft and wildlife uses.

Following an interesting introduction describing the parts of a tree, a general key to tree groups is given, and the author continues with the identifying characteristics of the regional conifers and broad-leaved trees. A bibliography of selected reading references and an index completes this handy volume.


AMERICA'S NATURAL WEALTH, by Richard Lieber. Published by Harper & Brothers, New York, N. Y. 245 pages, illustrated. Price \$2.50.

This is the story of the use and abuse of our natural resources, told by a man who has given the best years of his life to expounding and promoting conservation. Since 1912 Richard Lieber has been an active and prominent figure in the field of conservation, and when it is remembered that conservation has been defined as the organized effort to make men more aware of their indispensable partnership with nature, it is not surprising that he has written this book, telling of the extent of the use and waste of America's natural wealth — covering her minerals, forests, waters, agriculture and parks. Readable, convincing,—the author paints, very simply, an over-all picture of our basic natural resources, their depletion, and the opportunities offered today for action, both public and private, to forestall exhaustion of vital materials. It is a book to read, and own.

THE VOYAGEUR'S HIGHWAY, by Grace Lee Nute. Published by the Minnesota Historical Society, St. Paul, Minnesota. 133 pages, illustrated. Price, 75 cents.

Dr. Nute, who knows so well the way of life of the voyageur, who is an authority on the colorful history and romantic past of the region of the North Woods, tells the unique story of the border-lakes country in a fascinating way. Amazed to discover that few of the many visitors to that wildly beautiful region ever realized how far back in recorded American history its story begins, Frank Brooks Hubachek, conservationist and native Minnesotan, contributed generously in the preparation of this volume. Loving the Su-

NEW BOOKS *and*



OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

perior country, he felt that something should be done about it and appealed to the Minnesota Historical Society for assistance—the result being the present volume.

AN OUTLINE OF FORESTRY, by Thomas Thomson and M. R. K. Jerram. Published by Thomas Murby and Company, London, England. Available from Nordemann Publishing Company, Inc., New York, N. Y. 208 pages, illustrated. Price, \$2.25.

"An Outline of Forestry" was written to acquaint students with the kind of knowledge they will need to acquire in the study of forestry. The simple explanation of purpose, value and economics in the practice of forestry will enable them to ask intelligent questions as professional students.

In no wise a textbook, this outline will stimulate an interest in forestry as a career and will also aid laymen in obtaining an understandable background of forest conservation and the practice of forestry.

THE INTERNATIONAL PROTECTION OF WILD LIFE — An Examination of Treaties and Other Agreements for the Preservation of Birds and Mammals, by Sherman Strong Hayden. Published by Columbia University Press, New York. 246 pages. Price \$3.00.

Advanced students of biology, history, economics, and public law will gain much from Dr. Hayden's review of the age-old question of wildlife preservation and the need for effective cooperation among the various countries in according protection to wild bird and animal life.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

The Wood Preserving Industry and the Conservation of Forests, by Grant B. Shipley. A review of the Lumber, Cross Tie and Wood Preserving Industry in the United States. Grant B. Shipley, Koppers Bldg., Pittsburgh, Pa.

Cover Crops for Soil Conservation, by Walter V. Kell and Roland McKee. Bureau of Plant Industry, U. S. Dept. of Agr., Farmers' Bulletin No. 1758.

Ragweed and Its Eradication. The Mass. Horticultural Society, Horticultural Hall, Boston, Mass. Price 10 cents.

Yield of Even-Aged Stands of Loblolly Pine in Northern Louisiana, by Walter H. Meyer. Yale Univ., School of For., Bull. 51. Yale Univ., New Haven, Conn. Price 40 cents.

Management of Loblolly Pine in the Pine-Hardwood Region in Arkansas and in Louisiana West of the Mississippi River, by Herman H. Chapman. Yale Univ. School of For., Bull. 49. Yale Univ., New Haven, Conn. Price \$1.00.

The Virgin Upland Forest of Central New England, by A. C. Cline and S. H. Spurr. Harvard Forest Bull. 21. Harvard Forest, Petersham, Mass. Price, 50 cents.

Maintenance Costs of State Parks and Similar Scenic Areas, by Laurie Davidson Cox and Rhodell E. Owens. Bull. No. 23, New York State College of Forestry, Syracuse University, Syracuse, N. Y.

Using Crop Residues for Soil Defense, by F. L. Duley and J. C. Russel. U. S. Dept. Agr. Misc. Pub. No. 494. Supt. of Docs., Wash., D. C. Price, 5 cents.

Municipal and County Parks in the United States—1940. Report of a study by the National Park Service, with cooperation of the American Institute of Park Executives and the National Recreation Association, under the direction of George D. Butler. National Recreation Association, 315 Fourth Avenue, New York, N. Y. Price, \$1.50.

Importance of Fungi and Defects in Handling Alaskan Airplane Spruce, by Dow V. Baxter and Reed W. Varner. Circ. No. 6, School of Forestry and Conservation, Univ. of Mich., Ann Arbor, Mich.

Hearings Before Select Committee on Conservation of Wildlife Resources. U.S.H.R., 77th Congress, 2nd session. Govt. Printing Office, Wash., D. C.

Nursery Practice for Trees and Shrubs—suitable for prairie-plains. By H. E. Engstrom and J. H. Stockeler. Misc. Pub. No. 434, Forest Service, U.S.D.A. Supt. of Docs., Wash., D. C. Price 25 cents.

SCIENCE AND EQUIPMENT

Indian Fire Pumps

Fire pumps are essential to forest fire control, particularly this year when timber production for the war effort will be at its peak. Indian Fire Pumps, produced by D. B. Smith & Company, Utica, New York, have a record of good service by foresters, lumbermen and conservation departments. Under war conditions they are also being used by defense industries and by the Army and Navy.

Outstanding features of the Indian pump include a rust proof five-gallon tank that may be filled at lake, stream, or other water supply; a powerful pressure stream that drives at the base of the flame; and an adjustable nozzle for spray when needed.

The outfit is carried slung on the back or by carrying handle. The tank is curved to fit the back without chafing or rubbing. Further details may be obtained from the manufacturer.

Basement Window Greenhouse

"Gem"—a small lean-to greenhouse calculated to permit gardening all year round, has been announced by Ickes-Braun Manufacturing Company, Chicago. Built of cypress, it comes in semi-assembled sections.

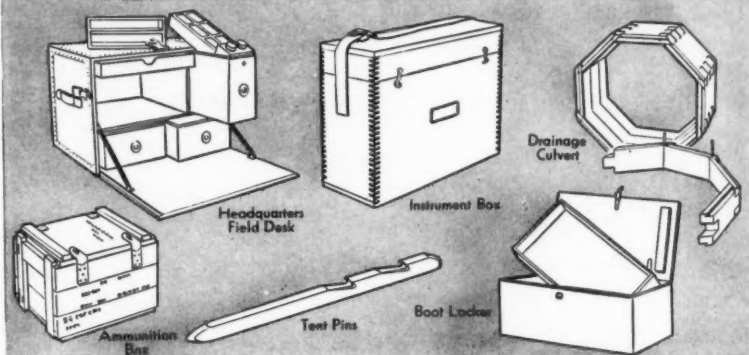
According to the manufacturer, no special heating system is required, since the waste heat that comes through the basement window is generally sufficient. Flowers can be raised in the winter and tended through the doors on either end or through a basement window.

Wood Pipe

The Armeo Drainage Products Association, Middletown, Ohio, has announced a new emergency pipe to relieve the drain on critical metals. It is of wood structure and requires no metal reinforcing. The units are shop assembled and joined together in the field.

Strength tests, according to the manufacturer, show that the emergency pipe possesses many of the structural characteristics of corrugated metal pipe. It has flexibility which enables it to build up side support. The thickness of the wood can be varied with the diameter of the pipe. This substitute is intended to outlast the five to ten-year period for which most of the present army camps and cantonments are being built.

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2 yr. Colorado Blue Spruce, 2 to 5 in.	10.00	
2 yr. Douglas Fir, 3 to 7 in.	11.00	
3 yr. American Arborvitae, 4 to 8 in.	30.00	

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Post-War Farm Lumber Needs

POST-WAR requirements for lumber on farms are estimated at 5,900,000,000 board feet a year, made up of 5,044,000,000 board feet for repair and replacement of buildings, 700,000,000 for buildings on new farms, and 159,000,000 for uses other than on buildings. This is one of the conclusions reached by Frank J. Hallauer of the U. S. Forest Service in a report on lumber requirements on the farm—part of a nationwide forest survey.

Lumber consumption in the future will be needed largely for maintaining the present farm plant by repair and replacement, the report says. The 5,900,000,000 estimate does not provide for any higher standard of farm buildings. Additional lumber requirements to achieve this standard are estimated up to 2,600,000,000 board feet a year.

"Agricultural technicians," the report

points out, "have long been aware that farm buildings on the whole are below a standard needed for efficient farm operation or for satisfactory living conditions. National attention was focused on better farm housing as an aid in the solution of unemployment prior to the war emergency, and it is evident that new measures will be used to stimulate farm construction when the time comes for action. The matter ranks high in post-war planning. . . . Consumption of lumber on farms varies with economic conditions. It has been on the increase for several years, but a period of construction above normal is needed to balance the subnormal volume since 1930."

The war emergency has increased the demand for farm products and consequently the need for better service buildings, according to the report.

Dutch Elm Disease Committee Reports

MINIMUM requirements for control of the Dutch elm disease for the duration of the war were set forth early in January by the Northeastern Committee on the Dutch Elm Disease. Recommendations were as follows:

The continuation of research programs with special emphasis on investigations bearing directly on control; continuation in the border zone and in isolated infection areas of scouting, removal of diseased trees and sanitation, as effectively as possible with regular federal appropriations; integration of state and municipal programs with the federal program in order to prevent a build-up of the disease; and strengthening of quarantines against the transportation of elm wood, including firewood, from infected areas.

The committee also endorsed an edu-

cation program prepared especially for the owners of elms and the public officials in charge of city and town shade trees to be initiated and carried on jointly by federal, state and private organizations. It was urged that the National Conference on Dutch Elm Disease sponsor a late winter meeting to develop plans for such a program.

Commenting on the outlook for control of the disease for the duration of the war, the report of the committee stated: "We are in the midst of a great war and expenditures for projects such as this should be reduced to a minimum consistent with reasonable safety. War necessities must take precedence over civilian activities. There is also grave doubt whether men or materials can be obtained for this project by next year, even if funds are available, and it seems certain that public appropriations, federal, state and municipal, will be difficult to obtain for this type of work for the duration. It therefore becomes largely a question of economic balance. Should all work on this disease be discontinued for the duration with the probability of a huge build-up of both diseased trees and of insect population, as well as the rapid extension of the infected area, which will require the expenditure of large sums and many years of effort to overcome? Or should we try to hold the gains already made? It is the judgment of this committee that the latter course is the sensible one to adopt. It also believes that plans for future work should be based upon regular appropriations with a smaller but more efficient force, rather than to depend chiefly upon WPA allotments, as in the past."

Conservation Calendar

(From page 130)

which national forests are situated supplemental to those authorized by the Act of May 23, 1908. Introduced January 11, 1943. Referred to the Committee on Agriculture and Forestry.

S. 406—Hatch and Hayden (H. R. 989—Colmer)—To revise the method of determining the payments to be made by the United States to the several states with respect to conservation lands administered by the Department of Agriculture. Introduced January 14, 1943. Referred to the Committee on Agriculture and Forestry.

H. R. 1392—Manasco—To authorize payments in lieu of taxes to counties and other political subdivisions in which national forests are situated. Introduced January 21, 1943. Referred to the Committee on Agriculture.

Public Domain

S. 275—McNary (H. R. 1688—Ellsworth)—Relating to the administrative jurisdiction of certain public lands in the State of Oregon. Introduced January 11, 1943. Referred to the Committee on Public Lands and Surveys.

H. R. 838—Robinson, Utah—Declaring certain lands to be a part of the public domain and providing for the administration thereof. Introduced January 7, 1943. Referred to the Committee on the Public Lands.

Research

S. 44—McNary (H. R. 1456—Randolph)—To amend Section 9 of the (McNary-McSweeney) Act of May 22, 1928, authorizing and directing a national survey of forest resources. Introduced January 7, 1943. Referred to the Committee on Agriculture and Forestry.

Water and Stream Control

S. 186—White and Brewster (H. R. 98—Mrs. Smith)—To create a Division of Water Pollution Control in the United States Public Health Service. Introduced January 7, 1943. Referred to the Committee on Commerce.

H. J. Res. 68—To prevent pollution of streams by pulp and paper manufacturers. Introduced January 25, 1943. Referred to the Committee on Rivers and Harbors.

H. R. 802—Rankin—To provide for the creation of conservation authorities. Introduced January 7, 1943. Referred to Committee on Rivers and Harbors.

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20 Assorted Rhododendrons—Beauty without cultivation, free of all usual pests! Plants now 1 ft. high, with small earth ball. Small, but vigorous. 5 each of following kinds: Rhododendron maximum (white, July), carolina (pink, May), catawbiense (red, June), Kalmia (Laurel) (pink, June). \$10

3 Showy Berry-Trees—Handsome blooms in spring, then a show of bright berries in fall that the birds love. One each, 4 to 5 foot, transplanted—Mountain Ash, White Flowering Dogwood, Paul's Scarlet Hawthorn. \$5

FOR FOOD:

5 Dwarf Fruit Trees—A complete home orchard for the really small place. Dwarf fruits spaced only 10 feet apart—2 year olds to bear next year—no ladders for spraying and picking—large fruit. Red Astrakhan Apple (summer), McIntosh Apple (autumn), Duchess d'Angouleme Pear, Italian Prune Plum, Elberta Peach. \$15

10 New Giant Blueberries—Strong 4-year olds (bearing age) now 1½-ft. high. Assorted named varieties, our selection, but all good. \$12

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Tropical Crop Specialists Needed

The United States Civil Service Commission has announced the need for persons with a practical knowledge of the production of rubber and oil-producing crops and other tropical plants for service in Central and South America. The positions will pay from \$2600 to \$8000 a year.

Persons appointed will do work in connection with the establishment and operation of research stations or plantations growing rubber or oil-producing plants. Plantations will be situated, for

the most part, in remote and primitive areas.

For some of these positions, persons are desired who have had education with major study in forestry, agronomy, plant breeding, horticulture and other courses related to plant production, in addition to experience.

Qualified persons are urged to apply immediately to the U. S. Civil Service Commission, Washington, D. C. There are no age limits, and no written examination will be given.

National Forests at War

(From page 115)

ing, recreation facilities afforded increasingly useful service in providing beneficial outings for men and women from nearby war plants working under the strain of emergency production. A number of national forest "organization camps" were made available to the military services for use as convalescent and rest camps.

National forest personnel and facilities are aiding the war effort in many other ways. The engineering facilities of the Forest Service were called upon by the Army Corps of Engineers for aerial survey and topographic mapping work covering several thousand square miles. Forest Service engineers did all the architectural work for three hospitals to be built along the new road to Alaska. When the production phase of the Emergency Rubber Project was assigned to the Forest Service a number of national

forest officers were detailed to Salinas, California, and other western points, and are now engaged in speeding up the production of guayule as an American source of natural rubber.

The portable, two-way radiophone equipment the Forest Service developed for communication in connection with fighting forest fires has been of material help to the armed services, and the Forest Service's chief radio specialist was recently commissioned by the Army to aid in military communication problems. Several other types of forest equipment, such as the trail tractor and snow motor, have been made available to the Army, and the pioneering work of the Forest Service in dropping supplies and personnel by parachute to going fires aided the Army in organizing and training its parachute troop units.

National forest officers are often key men in local civilian defense activities, over and above their regular duties. Many are serving on state and county war boards, participating in volunteer defense work and other war work on the home front. Some 28,000 tons of scrap metal have been salvaged in the national forests, much of it from abandoned mines and sawmills. Many ranger stations have been serving as community clearing houses for scrap, with neighbors and local settlers bringing in their scrap metal and rubber in wagons, wheelbarrows, and by hand. Rangers collected many tons by pick-up truck on their rounds in the back country; one ranger even brought in 250 pounds by pack-horse from distant sections of the forest.

And, anxious for an even more direct crack at the Axis, nearly a thousand Forest Service officers, twenty per cent of the total regular staff, are now on military furlough and have changed their uniforms of forest heather-green for uniforms of olive drab or navy blue.

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4 yr. Transplants (2-2), 4-8 in.		25.00	ENGELMANN SPRUCE		
NORWAY RED PINE			4 yr. Transplants (2-2), 3-6 in.		20.00
3 yr. Transplants (2-1), 3-6 in.		12.00	NORWAY SPRUCE		
4 yr. Transplants (2-2), 5-10 in.		15.00	4 yr. Transplants (2-2), 4-10 in.		20.00
SCOTCH PINE			WHITE SPRUCE		
3 yr. Transplants (2-1), 4-10 in.		15.00	4 yr. Transplants (2-2), 4-10 in.		15.00
			5 yr. Transplants (2-2-1), 5-10 in.		25.00
			6 yr. Transplants (2-2-2), 9-15 in.		30.00

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Fryeburg, Maine

BUY WAR BONDS AND STAMPS REGULARLY

The Indian—Worker in Wood

(Front page 120)

It was at collective enterprises that the Indian woodworker excelled. The stimulus of fellow craftsmen at work with him, the added efficiency of two men or a group of men in handling heavy work, the development of some time or labor saving method by a nearly

logger go out and bring the timber down to earth. It is trucked into the reservation sawmill and made into rough and finished lumber by Indian workers.

This lumber is used in constructing Indian homes and community buildings on the reservation. Many of the carpenters who do this work are Indians. Others use the facilities of a well equipped workshop with power tools to turn out toys and objects for sale. Children and women, as well as the adult men, are eager to participate in the woodworking program.



Whittling a bow was frowned upon by early Indians. Theirs were patiently scraped

naked genius—these added up to advanced woodworking technology in the hands of native tribes. Even today an Indian workman is unhappy at his job alone.

They seem to have a natural aptitude for carpentry. At the time of the white man's coming, an unsung inventor of the Haida tribe had even devised a vise with which to hold small objects which were being worked by crude methods. This latent ability in woodworking is being encouraged by the educational program of the Office of Indian Affairs.

Out at Whitewater, Arizona, for example, on the Fort Apache Reservation, the Indians have set up their own sawmill. A crew of timber cruisers blaze the trees which are to be felled. Apache

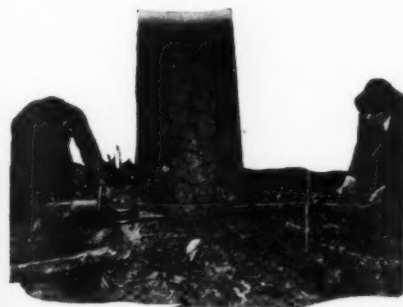


Modern youngsters learn to carve totem poles at an Indian school in Alaska

The American Indian has an honorable history as a worker in wood. Now, with Uncle Sam's guidance, plus a few mechanical aids which have developed since the stone ax days, these all-American artisans are entering a new era of civic service, community pride, and wood-working craftsmanship.

The
ATKINS
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To Pressing Wartime Needs
for MORE LUMBER



The ATKINS-HASSLER Electric Tree Faller



To increase the output of lumber with the fewer men now available, use the Atkins-Hassler Electric Tree Faller. So great is the cutting capacity of this modern power saw that it reduces manpower requirements 60 to 75 percent!

The way this saw rips through huge trunks of standing timber . . . bucks felled trees . . . speeds up limbing . . . is something to see. Cutting through a 54" softwood log in 70 seconds is average performance.

The Atkins-Hassler Tree Faller is electrically powered from a tractor or skid mounted generator — operates dependably in any weather. Its many other advantages make a long list: Lower stumps, less inventory in down timber, less fire hazard, less degrade, lighter in weight than any other equipment of its kind, and many more.

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Cutting a Name for Themselves in
National High Speed Production

—UPSON RESIGNS FROM WPB—

Arthur T. Upson, director of the Lumber and Lumber Products Division of the War Production Board, resigned late in January. He will be replaced by J. P. Boyd, former chairman of the Lumber Committee of the Army and Navy Munitions Board, and at one time associated with Weyerhaeuser Sales Company.

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We need Dogwood five inches in diameter, the cutting of which in no way hurts your other timber or the beauty of the roadsides. It is in the national interest to let the small, blossoming trees mature for birdlife and beauty until of usable size.

We are now buying Dogwood off several pulp tracts as well as Government forests, and invite inquiries from additional forest owners and foresters. We will send full particulars of size, grade and price.

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Fifteen Ton "Special"—Weight 680 lbs.

Positive internal brake—Two quickly shifted speeds—Adjustable length crank handle—anti-friction ball bearings—Spring operated safety dog. Only eight parts. No keys or set screws to strip. Drum instantly free spooled for running out cable.

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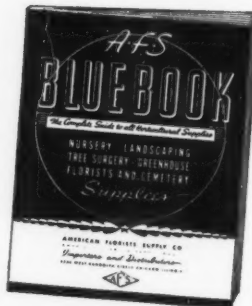
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You Can't Win With Fire

(From page 128)

key men. The bulk of emergency fire fighting crews for 1943 must therefore be drawn from high schools and include boys fifteen, sixteen and seventeen years old."

Last year, says Forester Goodyear, a Forest Defense Council was set up in Washington to pool and direct the full resources of all agencies, including the Army and Navy, in the event of a major fire disaster. At the same time, open fires, such as brush and slash burning, were prohibited, not alone as a safety measure, but also to keep the skies clear of smoke, imperative for ground and aerial observation. One of the results of this action was to reduce drastically the number of man-caused fires.

Washington will organize pretty much along the same lines in 1943. "But," says C. S. Cowan, chief fire warden of the Washington Forest Fire Association, "it is hoped that Congress will appropriate the necessary funds in ample time to train fire suppression crews. July is too late. We must prepare well ahead of the danger period, and to meet a national emergency, national funds are needed—in time."

Oregon also established a Forest Defense Council along the lines of its sister state. A joint report from N. S. Rogers, state forester, and John B. Woods, secretary of the Oregon Forest Fire Association, indicates further development in cooperative administration for 1943. Also, greater emphasis on citizen cooperation. "Success is dependent upon the full cooperation of every citizen," these fire protection leaders point out. "This was proven last summer when, with all interests united, an all-time low in man-caused fires was achieved in Oregon. With this experience behind us, we hope to do an even better job this year."

The situation in California is de-

scribed by S. B. Show, regional forester for the United States Forest Service, as "more serious than in 1942," due to a continuing manpower shortage. This viewpoint is also shared by S. R. Black, secretary of the California Forest Protective Association. "This situation," he states, "can be offset in part by the use of women, even in fire fighting crews. Our major objective, however, should be an even more intensive drive in the development of cooperating volunteer units—as was done during World War I."

Typical of the fire problem in the Lake States is a report from H. R. Sayre, chief of field administration for the Michigan Department of Conservation. "We were confronted with a manpower problem early in 1942," he states. "Towermen and fire wardens left to work in war plants. Others went into the armed forces. A doubling of our timber cutting operations created an additional hazard. We feared sabotage. To meet this situation, the department set up a system of 'forest fire cooperators' through which it secured the promise of help and equipment from local people. At the same time, an educational program was launched to teach people how to prevent fires, how to fight them, and how to operate fire equipment. We believe this program was extremely helpful in achieving a very low fire record—but 14,000 acres burned."

"During the approaching season we expect to obtain some assistance from the State Council of Defense. We will lack materials and priorities, and may become seriously involved in a transportation problem. All of this makes it more pertinent that we secure large numbers of local volunteer fighters and that they be adequately trained. The situation is extremely critical, but not a hopeless one."

In the East and South, the manpower situation is not so acute. This is due primarily to large populations in close proximity to forest areas, better access to forests, and the opportunity to organize local citizens effectually for volunteer service—such as is performed by the Triple-FS. Large populations, however, contribute heavily to fire danger, and it is in these sections of the country that man-caused fires take their heaviest toll.

It is in these regions, more than any other, unless the much used dwarf forests of southern California are included, that citizens must take up arms against man-caused fires. To prevent forest fires must become, to them, just as important to the winning of the war as other accepted patriotic duties. To buy a \$100

war bond today and burn \$10,000 worth of needed timber tomorrow is not good patriotism any more than it is good business. Rationed use of a citizen's car becomes only a costly joke when he is responsible for a blaze that requires motorized equipment to suppress, thus wastefully consuming many times the gasoline and rubber he saves.

Harris A. Reynolds, secretary of the Massachusetts Forest and Park Association, with long experience in eastern forest protection, states the case very simply. "Experience in this state has proved conclusively," he says, "that it is far cheaper to prevent fires from starting than it is to put them out."

If any one questions this statement, Mr. Reynolds offers the records of the Cape Cod Forest Fire Prevention Experiment conducted several years ago. In a locale where bad fires were experienced every month of the year, it was definitely developed that with twenty per cent less money for patrol, suppression and education, fire losses could be reduced by as much as eighty per cent.

If loss from the nation's 180,000 man-caused fires can be reduced even fifty per cent, war production will be greatly benefited. Less smoke will rise to impede military and naval training and action. The manpower situation, termed "desperate" by P. A. Thompson, chief of the Division of Fire Control, United States Forest Service, will be materially relieved, permitting greater concentrations of trained fire fighters in the regions most subject to sabotage and lighting hazards.

Problems of state foresters such as J. M. Stauffer of Alabama, who reports that "Our most serious problem and one that is not presently susceptible to solution is the loss of trained foresters," will be greatly relieved. To date, Mr. Stauffer has lost eighteen foresters to the armed forces and, to use his own words, "there is apparently no way to make up for this loss, as technically trained personnel are just not available." Any material reduction in man-caused fires will mean that the whole forest scene, now so black, will take on a brighter hue.

This reduction in man-caused fires can be achieved, of course, by recourse to proclamation. By executive or military order open fires of any nature, whether they be campfires, brush burning, or fires to smoke out ticks and snakes, can be prohibited under heavy penalty. But it will be more in accord with democratic principles if this is accomplished voluntarily by aroused and determined citizens.

After all, isn't this the sort of thing Americans are fighting for?

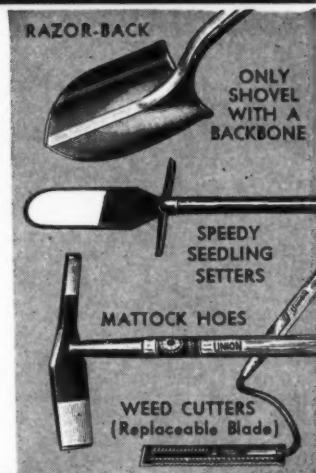
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Your work of protecting the forests requires shovels and other heavy duty hand tools. Our work of making these tools requires millions of feet of tough, resilient white ash for handles.

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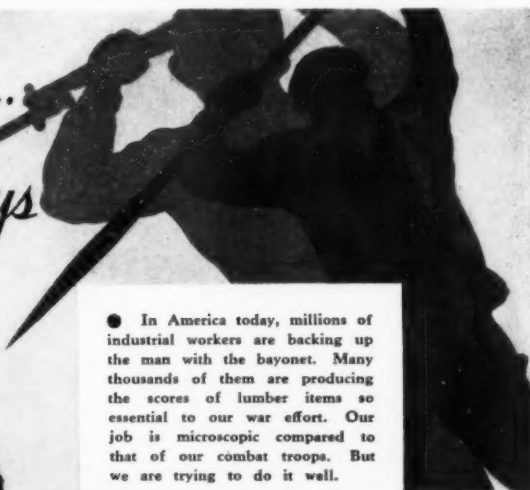
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● In America today, millions of industrial workers are backing up the man with the bayonet. Many thousands of them are producing the scores of lumber items so essential to our war effort. Our job is microscopic compared to that of our combat troops. But we are trying to do it well.

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Financial Statement

The American Forestry Association

BALANCE SHEET AS OF DECEMBER 31, 1942

ASSETS		LIABILITIES AND SURPLUS	
Cash	\$11,587.22	Accounts Payable	\$966.05
Accounts Receivable	1,776.50	Reserve for Prepaid Memberships	25,639.94
Accrued Interest Receivable	1,434.57	Surplus	282,440.49
Inventories	5,751.43		
Deferred Charges	2,659.74		
Endowment Fund (Including Real Estate)	283,614.30		
Furniture and Equipment	2,222.72		
TOTAL	\$309,046.48	TOTAL	\$309,046.48

INCOME AND EXPENSE ACCOUNT FOR YEAR ENDED DECEMBER 31, 1942

EXPENSE		INCOME	
General Administration	\$26,934.77	Membership Dues	\$48,032.86
AMERICAN FORESTS Magazine	32,145.41	Advertising	10,015.21
CONSERVATION Magazine	695.20	Interest	6,352.60
Membership	13,189.37	Donations	383.69
Forester's Office	2,493.49	Forester's Office	3,225.50
Educational Publicity	3,113.65	Miscellaneous	8,293.13
Operating Balance	1,780.09	Sale of Publications	3,097.27
		CONSERVATION Magazine	951.72
TOTAL	\$80,351.98	TOTAL	\$80,351.98

AS TRUSTEE FOR AMERICAN FOREST FIRE MEDAL PROJECT

Expenses	\$45.21	Receipts	\$51.32
Total Balance this Fund December 31, 1942			\$2,587.49

Eastward to China

(From page 117)

stood crops of beans, corn and grains. They grow on moisture stored in the soil, for it does not rain here. The crops are planted as soon as the fall flood waters recede—a method that has been followed for at least 6,000 years.

Sitting quietly beside the Blue Nile it came to me that fully 2,000,000 such evenings have come and gone since man first learned, in this storied land, to grow his food in quantities sufficient to give others a chance to do something else. I thought of that genius of a farmer in the remote past who hitched an ox to a hoe and for the first time applied power to agriculture. Those he released from the task of growing food had nothing to do and until adjustments were made there was doubtless distress and insecurity similar to that during our industrial revolution. At this time the Pharaohs employed many hundreds of thousands building great pyramids and temples. I have a suspicion that these were the world's first great "WPA projects."

This age-old urge of man to free himself from the burden of producing his food has led him into all sorts of difficulties. He has found no peace in this direction. Sooner or later he must learn that he must work in hallowed ground and do creative work in the soil. In this manner man may establish lasting and secure social structures in which a bounty of good things may be had by all. He will find satisfaction to his soul, body and mind in being a good steward working in the Holy Earth.

From the Upper Nile Valley we flew low over the game reserve east of Lake Albery. This enabled us to see a "zoo" in its natural state. Herds of wild elephants rushed together for protection against the roar of the great plane's motors, while numbers of brown buck scurried for cover. Near Lake George a frightened hippopotamus ran up on the bank; others splashed down into the water. Often crocodiles rushed for the water at our approach, wriggling their tails and slashing at all objects in their path in their haste. Truly, this was one of the most fascinating views of wild-life in its own haunts—a scene never to be forgotten.

Leaving these beauties we flew northward across wild country which dropped away toward the Sudan. Then to the upper Nile River with its bluish black water. Here great marshy growths of papyrus lined the stream. It was from papyrus the ancient Egyptians made their paper; in fact, from it came the word "paper." Over the Sudan, a vast plain of grassland, fires were burning.

YOUR INVITATION TO MEMBERSHIP

We extend to you a cordial invitation to participate in the program of The American Forestry Association which includes:

1. Intensification of present educational and legislative activities to assure the best possible protection of forests from fire, the adoption of improved methods of forest practice, and the avoidance of unnecessary waste.
2. Active promotion of research in the field of forest products, not only by the Federal Government but also by industry and educational institutions.
3. Critical and impartial appraisal of the forest situation, with particular reference to its changing status under war and post-war conditions.

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| <input type="checkbox"/> Contributing, per year..... 10 | <input type="checkbox"/> Life, no further dues..... 100 |

Name.....

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ALMOST as fatal as a bullet or a shell is the breakdown in the spirit of a sailor or a soldier.

Our men have the finest spirit in the world. But it must be maintained in the American way.

They must not be made to feel that they are mere automatons, fighting machines, as the armed forces of the dictators have been made to feel.

Life in our navy and army is hard. Discipline is tough. It must be. But there also must be moments

when the sailor or soldier is treated as Mr. Somebody-or-other.

That's where the USO comes in. For the USO is the banding together of six great agencies to serve one great purpose—to see that our boys in the camps and naval stations have a place to go, to turn to, a "home away from home."

The duties of the USO have more than doubled during the year. It must serve millions more men. Its field of operations has been enlarged to include many parts of the world.

To carry on its important work, the USO must raise \$32,000,000. It needs your contribution. No matter how small you make that contribution, the USO needs it. And it needs it now.

You are beset by requests for help on all sides. By all means, try to meet those requests. But among them, don't neglect the USO.

Send your contribution to your local USO committee, or to USO, National Headquarters, Empire State Building, New York.

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Flowers of the Redwood Region," by Willis L. Jepson . . . "The Story Told by a Fallen Redwood," by Emanuel Fritz . . . "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send \$2 for annual membership (or \$10 for contributing membership).

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sending up a smoky haze 12,000 feet. And then the desert.

We came down on the Nile and taxied into Cairo just one week after leaving Capetown. For me, it climaxed eight weeks of travel—24,000 miles over ocean, jungle and desert. But Cairo was only one more stop in my itinerary. My destination still lay eastward, beyond the high mountain passes of Tibet. To reach it I must travel by plane over the desert of Sinai to Palestine, refuel on the Dead Sea, 1,300 feet below sea level, and then over Trans-Jordan across the great desert and the Tigris-Euphrates valleys of Iraq. From there the way is over Iran, Afghanistan, India, Burma and the high mountains into Free China, nestled on the eastern side of the great Snow Mountains of Tibet.

I will then have returned to the ancient land of the Chinese after an absence of sixteen years. This time I come with a grave responsibility, to assist these great people in the formation of a soil conservation service and in a new attitude of man's responsibility to maintain for all generations the resources of the land. I am eager to be at the task.

WHO'S WHO

Among the Authors in this Issue

JOHN LINDSEY BLACKFORD (*Wildlife Is Worth Fighting For*), born in Montana, loves the western mountains with their vast forests and sunny pine groves. In his writing he says he endeavors to "transpose some western Nature-magic to the printed page" and—he does just that in his articles appearing currently in national magazines.

C. M. GRANGER (*The National Forests At War*), Assistant Chief of the U. S. Forest Service, in charge of National Forest administration since 1935—is a Wolverine. On completing his forestry work at Michigan Agricultural College, "Chris" Granger entered the Forest Service in 1907 and, in his career of continuous service since, has been entrusted with the execution of some of its most important and valuable work.



C. M. Granger

E. R. EDGERTON (*The Case of the White Pine Blister*) is a businessman of Spokane. Formerly a newspaperman and correspondent for the *American Lumberman*, he is secretary of the Western Conference for White Pine Blister Rust Control, in the work of which he is enthusiastically interested.

W. C. LOWDERMILK (*Eastward to China*) might well be called scientist extraordinary and minister plenipotentiary in soil conservation, for probably no man is more widely known both here and abroad for his distinguished work in that field. His erosion investigations have carried him to all parts of the Old World, and his present return to China is at the instigation of Generalissimo Chiang Kai-shek to help create a national plan, and formulate a soil conservation service for that great nation.

SIGMUND SAMETH (*The Indian — Worker in Wood*) is a professional anthropologist. A writer and archeologist as well, Mr. Sameth was a member of the Columbia University expedition which unearthed a four hundred year old Mandan Indian village, first discovered by the explorers Lewis and Clark.

ERLE KAUFFMAN (*You Can't Win With Fire*) is an associate editor of AMERICAN FORESTS.

THE COVER—"Forest Vista"—Photograph by Harold Orne.

CREDIT FOR PHOTOGRAPHS

Credit for photographs appearing in this issue is acknowledged as follows:

Blackford, John Lindsey—pages 102, 103, 104 and 105.

Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture—pages 109, 110 and 111.

Curtis, Asahel—page 127 (top).

Forest Service, U. S. Department of Agriculture—pages 106, 108, 112, 113, 114 (lower), 115 and 124.

Indian Service, U. S. Department of the Interior—pages 118, 119, 120 and 139.

Matthews, Oliver V.—page 126.

National Lumber Manufacturers Association—page 107.

Press Association, Inc., page 114 (top).

Soil Conservation Service, U. S. Department of Agriculture—page 117.



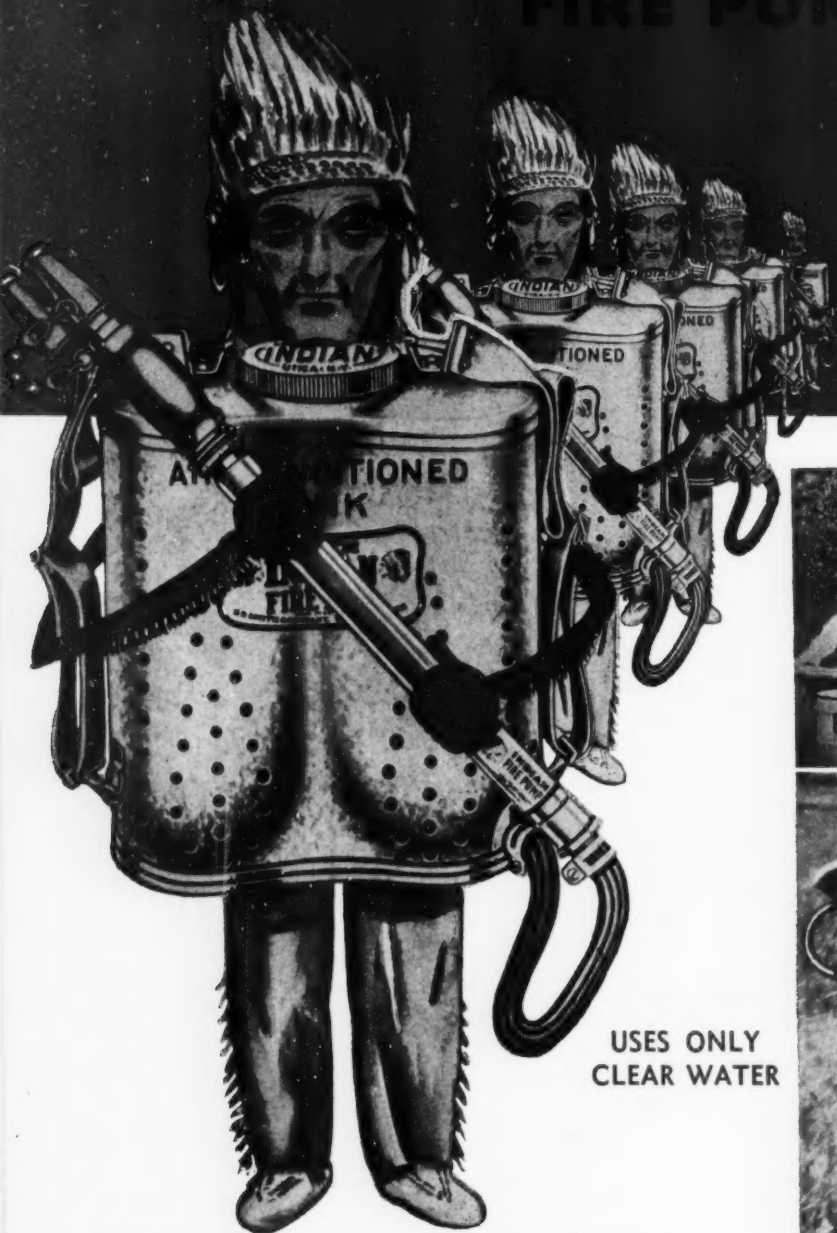
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INDIAN

FIRE PUMPS REPORT



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In the fields and forests, the camps and farms of America **INDIAN FIRE PUMPS** are giving a good account of themselves. Daily they save the resources of the Nation. (at top) A rural fire fighting crew rests after using **INDIANS** to stop a brush fire. (at left) Halting a grass fire with an **INDIAN**. (center) Timber they protect will go into war production for our fighting fronts.

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EVERY FIRE HELPS THE ENEMY

